

99'er

COVERING THE TEXAS INSTRUMENTS
BRAND OF HOME COMPUTERS



HOME COMPUTER

magazine

May, 1983 \$3.50 in U.S.A.

**Shopping Guide
to Word Processing**

Disk Drives Demystified

LOGO Tortoise's Retort

Maximizing Mini Memory

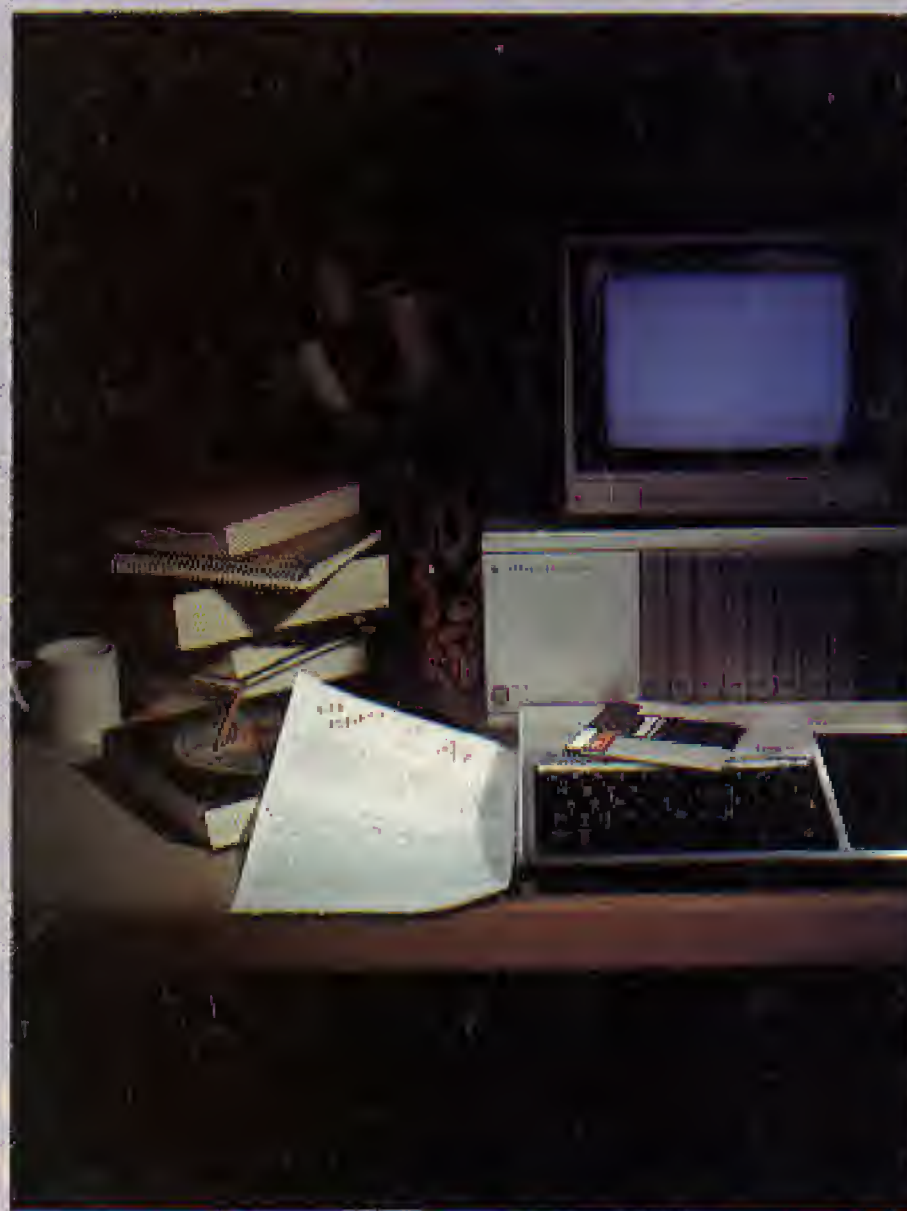
**Optical Illusions
with Sprites**

**Multiplan: The Answer
to "What If..."**

Computer Gaming Fun

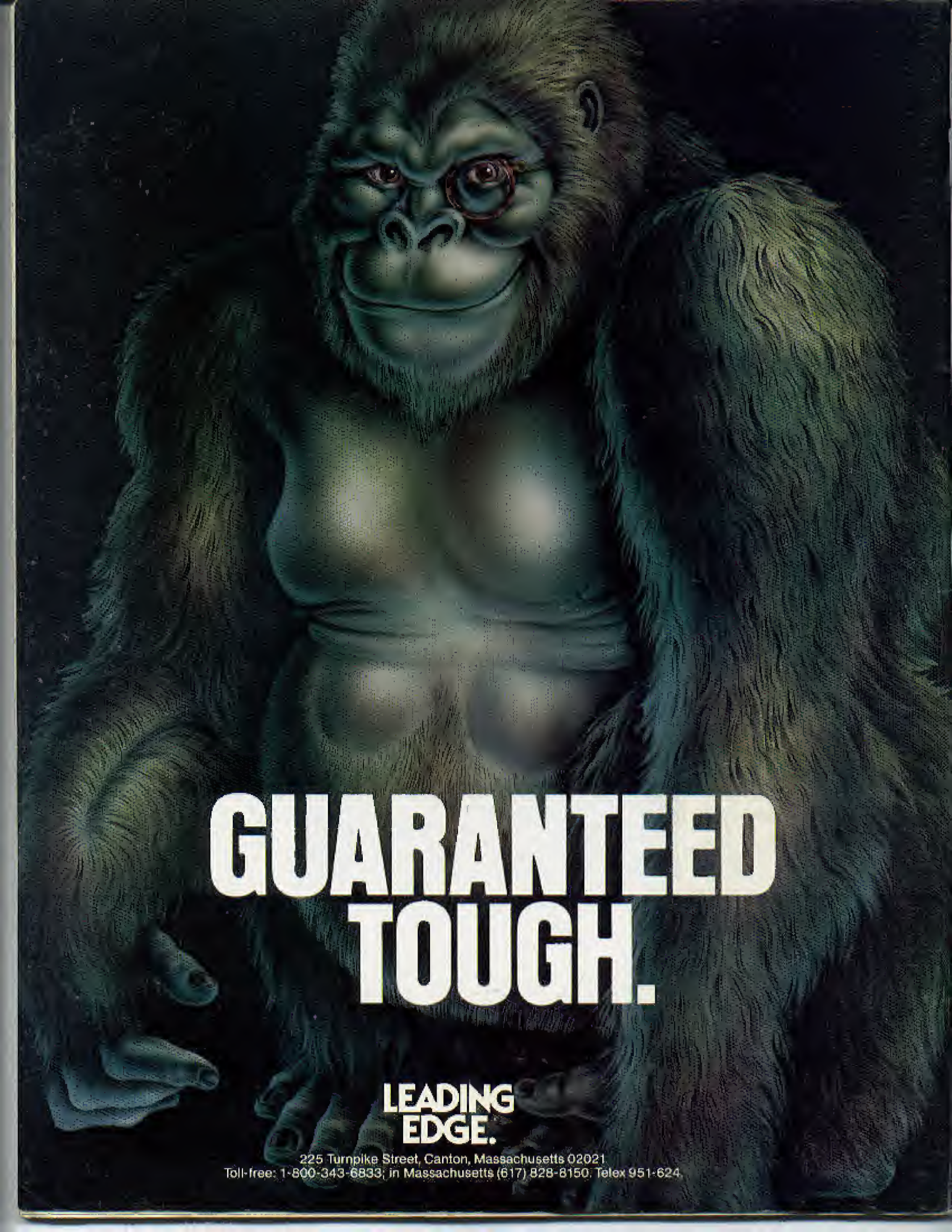
Your Window to Creativity

WORD PROCESSING IN THE HOME



0704 503201 46856BISPOB
RDN
BISHOP
PO BOX 11212
FT WAYNE
IN 46856





GUARANTEED TOUGH.

**LEADING
EDGE.**

225 Turnpike Street, Canton, Massachusetts 02021
Toll-free: 1-800-343-6833; in Massachusetts (617) 828-8150; Telex 951-624.

CAVERN QUEST

JUMP over bats, ghosts, and scorpions to reach the secret door beyond which perils lie. . . Can you make it to the Magic Chamber and slay the cavern creatures that guard the hidden treasures? There are twenty treasures to be revealed if you can



THE LATEST GAME FROM MOONBEAM SOFTWARE

avoid the treacherous grip of the never-ending claw monsters. . .

A habit-forming, multiple-screen, fast-action game of skill and strategy that will challenge even the most experienced player!
X-BASIC, \$19.95

• SPECIAL OFFER •

BUY ANY 2 GAMES, GET 1 FREE
OFFER EXPIRES AUGUST 31, 1983—LIMIT 1 PER CUSTOMER

Moonbeam Software will turn your computer into an arcade machine! Super-fast action games now ready to take over your controls! Dazzling full-color graphics! Explosive sound effects! All now available in TI-BASIC and/or Extended BASIC for the 16K console!

1) DEATH DRONES

Can you protect your nuclear reactor from the relentless Alien Drones? Will your city be reduced to rubble by devastating nuclear explosions? BASIC or X-BASIC, \$14.95

2) MOONVASION

Alien starfighters are attacking your moonbase! Can you aim and fire your Moon Launch fast enough? Will your squadron be destroyed? BASIC or X-BASIC, \$14.95

3) GARBAGE BELLY

Help the Garbage Belly gobble up ripe garbage in a field of garbage pails! But watch out! If you make him eat raw garbage, he will die! X-BASIC, \$19.95



4) STRIKE FORCE 99

Your planet is doomed! Destroy the Cryolian death ship before it unleashes its deadly death rays, annihilating your civilization! X-BASIC, \$19.95

5) MOONBEAM EXPRESS

Defend your cargo ship from enemy fighters on your supply mission to the outpost located deep in Quadrant 9! X-BASIC, \$19.95

6) ASTROMANIA

Pilot your fleet of photon-powered ships through the asteroid cannons of Sulconon, the aerial attack squad of Caustress, the meteor belt of Trisod! Then face the unforgiving Zircon Droids! X-BASIC, \$19.95

Moonbeam Software is the key to unlocking the full potential of your TI-99/4(A) computer! All programs are available on either cassette or diskette! Attractively packaged in full-color boxes, each game includes both keyboard and joystick versions.

Ask for Moonbeam Software at your local retailer or use the coupon in this ad.

Dealer inquiries invited. Call Mr. Moon at (413) 586-6290.



MOONBEAM SOFTWARE

2 Bridge St., Northampton, MA 01060
Telephone (413) 586-6290

YES! I want to turn my TI-99/4(A) into an Arcade Machine! Please send me the following game(s):
(Please circle C for cassette or D for diskette versions)

<input type="checkbox"/> DEATH DRONES C D \$14.95	GAMES \$
<input type="checkbox"/> MOONVASION C D 14.95	Mass. Res. Add 5%
<input type="checkbox"/> GARBAGE BELLY C D 19.95	Shipping & Handling 1.50
<input type="checkbox"/> STRIKE FORCE 99 C D 19.95	TOTAL \$
<input type="checkbox"/> MOONBEAM EXPRESS C D 19.95	<input type="checkbox"/> MIC <input type="checkbox"/> VISA Exp. Date
<input type="checkbox"/> ASTROMANIA C D 19.95	Card No.
<input type="checkbox"/> CAVERN QUEST C D 19.95	

Name _____ Signature _____

Street _____

City/State/Zip _____

BUY 2—GET 1 FREE

TI-99/4(A) is a registered trademark of Texas Instruments.

© All games copyright 1982 Moonbeam Software.

ON SCREEN

By Gary M. Kaplan
Publisher & Editor-in-Chief



“It is in the pages of this magazine that the state of the Home Computer world is mirrored . . . what we’ll see within the next nine months will totally eclipse all advancements made over the last two years.”

It’s been quite an exciting two years. That’s how long this magazine has been in print. During this time, I’ve been so busy that there has been little opportunity to reflect on events. As we celebrate our second anniversary, I think it’s now appropriate to sit back and take stock. If, in fact, “the past is prologue,” then an understanding of whence the home computer industry has come in the last two years will better enable us to envision whither it may go in the next two . . .

To say that there has been a great deal of change would be a gross understatement. I remember when the most exciting issue of the day was the demand for a better keyboard on the old 99/4 console. In the first issue of *99'er Magazine*, in fact, we ran an article on adding an external keyboard. The other “high tech” news item was that both we and Texas Instruments were making available a *dummy* “pinky key” for the right hand. On the old keyboard, touch-typists often couldn’t find “home” because there was no place for their pinky; this led to the errors which the dummy key was to correct. One might say that this pinky key was the first word processor *peripheral* for the Texas Instruments Home Computer.

To put things into perspective: Disk drives had just been made available for the system, Extended BASIC was still a promise of “things to come,” and of the very few people who had printers, 95 percent had only the TI thermal printer. Today, looking at the other end of this two-year sojourn, we can see that we’ve progressed from pinky keys to speech recognition, Winchester hard disk drives, spreadsheet software, a wafertape drive, CMOS memory cartridges . . . And who knows what other goodies are yet to come.

In that first issue I remember the articles about the *new* LOGO language that would eventually be available for TI Home Computer users. And there were the pieces I did on the UCSD Pascal language and software development system that was in the works. I remember too, talking with many callers who wondered whether TI would be introducing the FORTH language for the Home Computer. Well today, we not only have TI FORTH, but a couple of other implementations from third parties as well. And I think we’ve only just scratched the surface when it comes to languages for Home Computer users.

I can also recall the articles we did on language conversions—from TRS-80 and Apple BASICs to TI BASIC. In those early days, this was virtually a necessity due to the dearth of TI software. You don’t have to take my word on that—just look at the quantity of software advertisers in *99'er Magazine*’s inaugural issue, and then count the advertisers in the copy you have in your hands. To quote our servicemark: “Once you compare, there’s no comparison.”

Computer-Assisted Instruction has also come a long way. Back in our third issue, we looked at the available software for the Home Computer and noted that Scott, Foresman was the only serious third-party supplier of educational software. We now have a prodigious quantity of educational programs for the 99/4A from a couple of dozen different vendors, and are about to welcome in an exciting new dimension with the extensive PLATO library.

We are always excited when it comes to covering the Consumer Electronics Show: It is there that TI displays its new products. The first really big development came in June of 1981 when Texas Instruments unveiled the new version of the console—the TI-99/4A—and we finally had a *real* keyboard. Soon it became evident that the days of the “freight train” peripherals were numbered. And at the January, 1982 show, TI introduced the Peripheral Expansion System, whose possibilities impressed us enormously.

In the fall of 1982, things began to happen fast: TI started to ship the 99/4A in unprecedented quantity, and we launched TI-Fest—The (first) Home Computer Show.TM The San Francisco event was very well received and suggested future events (soon to be announced) across the country. During this time, the magazine switched from a bi-monthly to a monthly publication schedule. TI rang in the new year this past January by introducing two new machines as well as a promising line of compact peripherals. And in February of 1983, we changed our name. Today you’ll find us—as *99'er Home Computer Magazine*—on more and more newsstands with each passing month.

Yes, it’s been a very exciting two years. If you have some time, thumb through the old issues and you’ll appreciate what I mean. For it is in the pages of this magazine that the state of the entire Home Computer world is mirrored for you to see.

What will the next two years bring? Who can really say? One thing is certain however—the *rate* of change has increased. What we’ll see in the next nine months will totally eclipse all the advancements made over the last two years. So stay with us—the revolution has only just begun.



99'er HOME COMPUTER MAGAZINE

Framed in carefully chosen words, this month's cover photo depicts the fruits of a successful venture into word processing: an A+ paper. Flanked by the traditional paraphernalia of student life is the new tool that contributed to that academic achievement: a Home Computer with word processing capabilities. Students, both present and former, know only too well the process that brings forth a superior paper: long hours of writing, constant editing, endless typing and retying. With the stroke of a key, however, the word processor can instantly delete words, insert sentences, move paragraphs, adjust margins... all before a single mark appears on paper. And so, another tradition of academe—the "all-nighter"—falls by the wayside.

C O N T E N T S

May, 1983 Vol. 2, No. 7



9

From Cut & Paste to Keystroke
By Greg Roberts
Strategies for selecting word processing software.

12. Word Processor Market Basket

By David G. Brader
A consumer's guide to some popular word processors.

16. A Generalized Filing Program

By Brent R. Cromley
Very important papers find their proper places.

Computer Gaming



21

Diving for Doubloons:
A Review of Blackbeard's Treasure
By Steve Schwartz
Retrieve sunken treasure while dodging the demons of the deep.

22. "It's Game Show Time!":
A Review of Spin-A-Fortune
By David G. Brader
"Come on down!" and play this lively simulation game.

24. Gameware Buffet



24

Lost Ruins
By D.J. Burns
Uncover the relics of a lost civilization, but beware of cave-ins!



25

Beeline
By David W.F. Welcker
A honey of a challenge for any busy bee.

30. Multiplan Medium

By Patricia Swift
The medium balances your checkbook and checks your budget balances.

34. The School Secretary's Secretary

By Sharyn Lyon
Extracurricular activities abound without piles of paperwork.

42. Super Language—Mini Memory Relocator

By Martin Kroll, Jr.
See how to multiply your 4K of RAM by juggling your data.

Portable Computing



45

Touring Compact Computer Country—Part II
By Gary M. Kaplan
Explore Enhanced BASIC's special features.

LOGO Times



49

The BASIC Issue and the Tortoise's Retort
By Henry Gorman, Jr.
Two languages vie in a race for supremacy.

52. A Cure for the Listless

By S. T. Hall
A pocket program to keep data organized with linked lists.



55

Fulfilling Untapped Potential
By Sam L. Jenkins
Mentally handicapped learners team up with the TI-99/4A.

57. The Drive for Diskettes—Part 1

By Samuel Pincus
More efficient storage and faster data access can be yours.



67

Sprites in Depth
By W.K. Bathrop
3-D illusions on the video screen—not just for expensive computers anymore!

4. On Screen
6. Inside 99'er
7. Letters to the Editor
8. Group Grapevine
29. Debugs on Display
64. 99'er Digest
67. Answers to Crossbytes
67. Index to Advertisers

RTTY ASCII conversion p. 8



99'er Home Computer Magazine (ISSN 0745-6913) is published monthly by Emerald Valley Publishing Co., P.O. Box 5537, Eugene, OR 97405. The editorial office is located at 1500 Valley River Drive, Suite 250, Eugene, OR 97401. (Tel. 503-485-8796). Subscription rates in U.S. and its possessions are \$25 for one year, \$45 for two years, and \$63 for three years. In Canada and Mexico add \$7 per year. Other foreign countries \$43 for one year surface mail. Inquire for air delivery. Single copy price in U.S. and its possessions is \$3.50, and \$4.00 in Canada and Mexico. Foreign subscription payment should be in United States funds drawn on a U.S. bank. Second-class postage paid at Eugene, OR 97401. POSTMASTER: Send address changes to **99'er Home Computer Magazine**, P.O. Box 5537, Eugene, OR 97405. Subscribers should send all correspondence about subscriptions to above address.

Address all editorial correspondence to the Editor at **99'er Home Computer Magazine**, 1500 Valley River Drive, Suite 250, Eugene, OR 97401. Unacceptable manuscripts will be returned if accompanied by sufficient first class postage and self-addressed envelope. Not responsible for lost manuscripts, photos, or program media. Opinions expressed by the authors are not necessarily those of **99'er Home Computer Magazine**. All mail directed to the "Letters to the Editor" column will be treated as unconditionally assigned for publication, copyright purposes, and use in any other publication or brochure, and are subject to **99'er Home Computer Magazine's** unrestricted right to edit and comment. **99'er Home Computer Magazine** assumes no liability for errors in articles or advertisements. Mention of products by trade name in editorial material or advertisements contained herein in no way constitutes endorsement of the product or products by **99'er Home Computer Magazine** or the publisher unless explicitly stated.

Each separate contribution to this issue and the issue as a collective work Copyright © 1983 by Emerald Valley Publishing Co. All rights reserved. Copying done for other than personal or internal reference use without the permission of Emerald Valley Publishing Co. is prohibited. Requests for special permission or bulk orders should be addressed to the publisher.

99'er Home Computer Magazine, 99'er Magazine, Home Computer Magazine, and HCM are all trademarks of Emerald Valley Publishing Co.

Texas Instruments, TI, Constant Memory, Solid State Software, Hex-bus and Command Cartridge are all trademarks of Texas Instruments, Inc.

Multiplan is a trademark of Microsoft, Inc.

Publisher/Editor-in-Chief
Gary M. Kaplan

Managing Editor
David G. Brader

Assistant Editors
Greg Roberts
Judy Sanoian

Technical Editors
Robert Ackerman
William K. Balthrop
G.R. Michaels
Patricia Swift

Contributing Editors
Henry Gorman, Jr.
Walter Hego
Roger Kirchner
Samuel Pincus
Steve Schwartz
George Struble

Art Director
Hayder Amir

Production Manager
Norman Winney, Jr.

Production & Design
Laredo
Barbara Mickelson
Corby Poricha
Jennifer Somers

Office Manager
Pat Kaplan

Circulation & Fulfillment

Irene Alderman
Janie Cantu
Kathy Garcia
Jonnie Hernandez
Carol Hodges
Benjamin Kaplan
Coleen Nelson
Carol O'Brien
Lyndia Tennant

Clerical
Betty Gregory
Kathy Ricciuti

Financial Manager
Robert Karau

Accounting
Tasanee Fry
Patana Ratanapreux

Typesetting
June Gaber
Julienne Laabs

Advertising Manager
Linda Brundige
Tel. 503-485-8796

INSIDE 99'er

May is here! It's the month of picnics, bike rides, and sun-bathed baseball games. But, alas, it is also the time for term papers, journal articles, and all the paperwork needed to keep life organized. Wouldn't it be great to be done with these writing chores so that you could be outside dancing 'round the Maypole? Well, welcome to the world of word processing! Explore with us how to delegate some of your tedious writing tasks to your own friendly word processor.

Not sure if you should leave your scissors and glue behind to join the keystroke generation? *From Cut and Paste to Keystroke* explains what a word processor can do for you whether you are writing the Great American Novel or listing your summer chores.

Before you run for your wallet, check out *Word Processor Market Basket* for software purchasing particulars. You will find, at a glance, a sampling of what's available, cost comparisons, system requirements and all you need to make an informed decision.

Information for financial decisions is always welcome. In *Multiplan Medium* we feature this versatile software package in an application that will balance your checkbook and check your balances for a budget. While you're in the planning and organizing mode, you may want to update your filing system using our *Generalized Filing Program*. This program will be especially helpful for professionals who frequently must locate journal and magazine articles in their files.

Perhaps you're more the academic sort and would prefer the organizational aid of Professor Holl. This month, in *A Cure for the Listless*, he presents a pocket program that shows you how to use linked lists to insert and delete data with ease and panache.

Still within the hallowed halls of academia, we find the *School Secretary's Secretary*, a review of a software package to rescue the damsel in paperwork distress, thus giving her back the time and energy to provide quality extracurricular activities for our children.

Handicapped children and adults working with computers is the focus of *Fulfilling Untapped Potential*. Here, a software developer shares what he has discovered about computers and learning potential.

To explore the potential of the new CC-40, you can join us as we continue *Touring Compact Computer Country*. We'll explore the hills and valleys of using Enhanced BASIC with this promising little addition to the TI family.

And the little green emissary from the world of LOGO speaks up this month in *The BASIC Issue and the Tortoise's Retort*. You may be surprised at the depth of thought expressed in this computer-age discourse from the LOGO turtle. Not to be outdone, the sprites of Extended BASIC add their own special kind of depth. In *Sprites In Depth* you can explore the use of sprites to create 3-D illusions on your video screen and learn how to put the shadows of your graphics in their proper places.

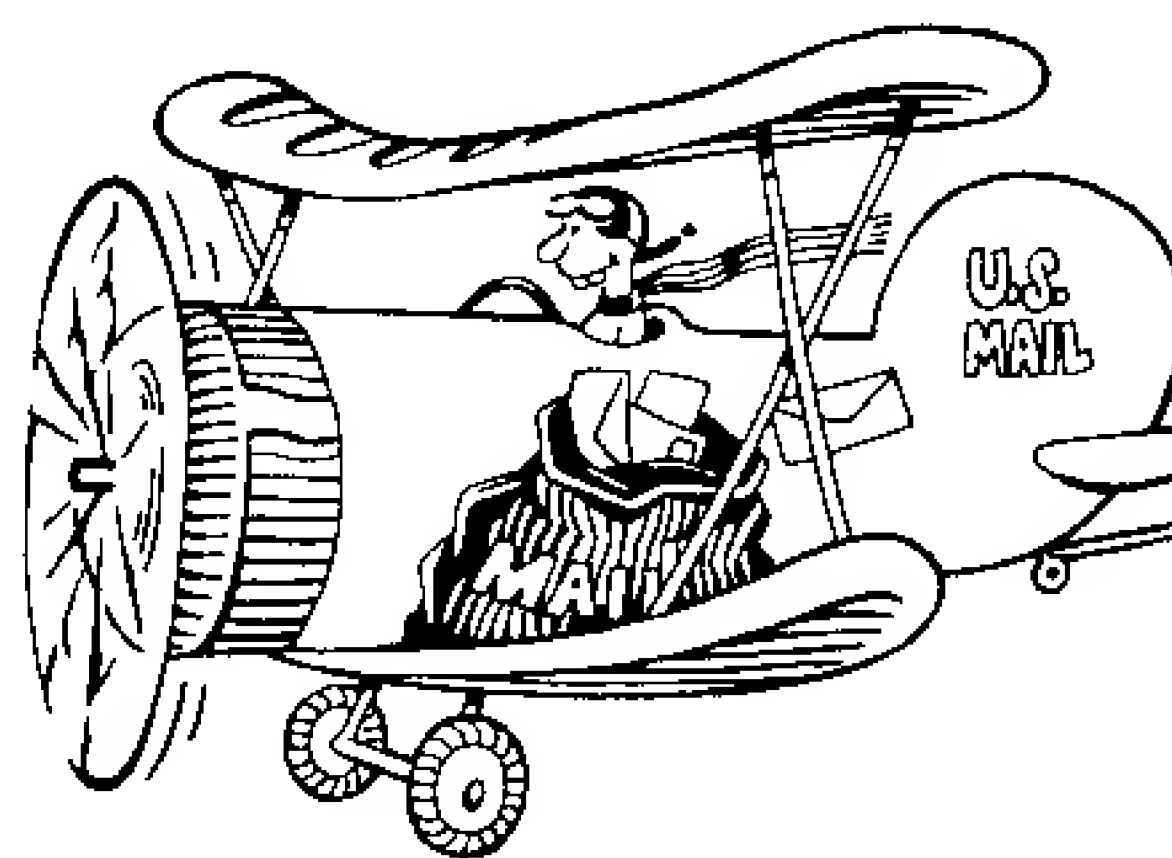
If you are looking for the proper place to store your data, the *Mini Memory Relocator* program can help you take full advantage of the 4K of RAM in your Mini Memory cartridge. Or, perhaps you want to take bigger steps to increase the memory of your system. After reading *The Drive for Diskettes*, about the care and feeding of floppy disks, you may decide to add a quick-loading disk drive to your present system.

Loading honey into a hive is your goal as the busy bee in the Extended BASIC game *Beeline*. While you are conscientiously gathering pollen from magical flowers, a nasty beekeeper is lurking about, ready to smoke you out of the hive. If you venture too far from the hive and get lost, do not despair. Make a beeline for the treasures in *Lost Ruins* instead! In this BASIC game you are projected into the future. Your mission: to guide your robot explorers as they seek out and recover the relics of lost civilizations. Although your digging is made easier with explosive charges, you must beware of cave-ins as you frolic about in the future trying to sort out the past.

What will the future *really* bring? Is anything certain in this ever-changing world of home computing? From what is reflected in this issue's special attractions, game reviews, and tutorial tips, we certainly can see the future promises an exciting kaleidoscope of possibilities. We'll be ready to share it all—you can be 99% sure of that!

Until next month, have fun reading, learning and RUNing!





LETTERS TO THE EDITOR

Dear Sir:

Have just finished filling out the questionnaire card, and I hate questionnaires because they never give me an opportunity to say all that I want to say, so I'll just sit down here and say it.

When I finally discovered your magazine last fall, it opened a new world to me. The other computer magazines seemed to be engaged in a conspiracy of silence regarding the TI computer and I had begun to think that I was the only person who had ever bought one. I hear that a couple of the other magazines have now realized that they had better recognize that the TI exists, but your magazine is certainly far better than any of those others that I used to search through.

I only hope that, in trying to cover the new TI computers and all the new developments in computing, that you do not spread yourself too thin and give each reader too little that is in line with his particular interest. The great majority of the people who pick up the 99'er on a newsstand will be those who have bought a 99/4A, read the BASIC Manual, tried to understand the Reference Guide, and are wondering—where do I go from here? A very small percentage will ever go as far as Assembly Language, and a majority will never find the money or the need for many of the peripherals.

The first thing that I read in each issue of the 99'er, even before I check out the game programs (well, almost) is the *Letters to the Editor*—not to read the praises for your magazine, but to read the programming tips, tricks, and short routines which your readers send in, and your replies to their problems.

Which brings me to why I started to write—I wanted to suggest that the most valuable feature that you could introduce would be a "Best of the Users Group Newsletters" column.

Jim Peterson
Columbus, OH 43213

Our first goal, Jim, is to please the majority of our readers with each issue. Our second goal is to give 99'er Home Computer Magazine long term value by including articles that can be useful references as your knowledge grows. Someday, you may be ready to try your hand at Assembly Language

with the Mini Memory or structured programming with LOGO.

Our Group Grapevine editor is on the lookout for good items to include from local users groups.

We have said it before and we will say it again— "99'er Home Computer Magazine is the least expensive peripheral you can buy for your TI-99/4A." Whatever you do, don't throw away these magazines—someday you may regret it . . .

Dear Sir:

As a new owner of the 99/4A and a new subscriber to 99'er Magazine, I must say that I am overwhelmingly pleased. The quality of TI hardware and software is only matched by the quality of your magazine. Now let me pose a question.

Perhaps I have missed an answer to this somewhere along the line, but I do not understand the bizarre behavior of the REMark statement in TI BASIC. You enter the word REM, space once, then follow it with your comment. It seems that when you go back later and list that statement, an extra space has been added between REM and your comment. Also, each time you make a change to the line using EDIT, it adds still another space. I think I have figured out what it is doing and when I should expect it, but I do not understand why it does this. It does not seem to serve any useful purpose and makes it difficult to get your comments left- and right-justified. There is, of course, nothing in the User's Reference Guide to explain this.

Don M. Chance
Blacksburg, VA 24060

You're right, Don, that is a characteristic of the TI BASIC REM statement. We don't have a good reason for you as to why it does it either, sorry.

Dear Sir:

I must ask you this question: The various programs that I have seen in the 99'er (BASIC or Extended BASIC versions) written by your staff or subscribers are consistently designed so that the headings and instructions for the program are placed at the end of the program. Most of the subroutines are interspersed throughout the program. Why are they written in this format?

The reason I am asking is that I was trained to write programs (at the University of British Columbia) with a logical flow through—headings and instruc-

tions for operating the program are at the front of the program; subroutines at the end of the program. The whole program is broken into a block structure, following the format set up in the flowchart (using a top-down design).

I realize that there are many ways to design programs, I just wonder what advantages the "99'er" style has over the "institutional" style?

Rick Laktin
Alpha-Omega Computer Services
Duncan, BC V9C 2J3

Most BASIC programmers have not received training in structured programming, Rick. In some programs, those who know the rules do not follow them (in special cases) for the sake of execution speed.

Dear Sir:

Reference your article on "Matrix Muncher," March 1983 edition.

I entered this program, line by line, into my computer. I ran the program, using the sample data. However, the results were not the same. The solutions I received were:

First Example—

X(1) = 16
X(2) = -20
X(3) = 39

Second Example—

X(1) = 2.462
X(2) = 13.85
X(3) = 8.31

As you can see, the second example was correct for X(2) and X(3), whereas, in the first example none were correct.

I even modified the program to Extended BASIC and received the same results.

Since I have had some computer training (AAS Degree, Computer Science), I attempted to analyze the program to find an error. However, since I don't completely understand the logic of the matrix, I could not determine where I went wrong (assuming no errors existed in the program as published) or if there were an error in the program.

I enjoy the magazine very much and the articles have been very informative; however, some programs (and some articles) are hard to understand. For example, the Assembly Language on the TI

Continued

Entering 99'er Programs

New readers should be aware that within the magazine's pages are found actual computer programs that you can put into your Home Computer and enjoy.

Make sure you have any special system components required by the program (i.e., the Speech Synthesizer, Extended BASIC cartridge, etc.). Then, using the console keyboard, you can type the printed

magazine listing (character for character, and line by line) into the computer's memory.

Before entering the program, connect a cassette recorder to the computer. Make sure you have two blank cassette tapes. For each 10-20 lines you type in, use SAVE CS1 to save that program segment onto one of the tapes. Alternate between the two tapes each time you save the program. Be sure to rewind to the beginning of each

tape before saving, so that you always record over and replace the shorter segment of program lines with the longer segment. By following this procedure, you'll always retain most of your work even if the lights go out or someone turns off the computer.

Double check your typing against the program listing for errors, and then have someone else check it. The most common errors are typing the letter "O" instead of the number "0" (zero)—they are not interchangeable to the computer. This is also true for the letters "I" and "L" and number "1" (one). See "Key-In Reference"

Every time you make a correction to your program, SAVE CS1 and switch the tapes. Once all the errors are corrected, you will have a good copy of the program on the last tape. Before turning off the computer, put the other cassette tape in your recorder and once again SAVE CS1. Now, if one tape gets damaged, you won't have to enter the program listing via the keyboard all over again. Have fun and happy computing.

99'er

Programming Conventions

KEY-IN REFERENCE

100 ABCDEFGHIJKLMNOPQRSTUVWXYZ+)(*
&^%\$#@!~/:; >., <,"' ? _ [\] ^ * 12
3456789

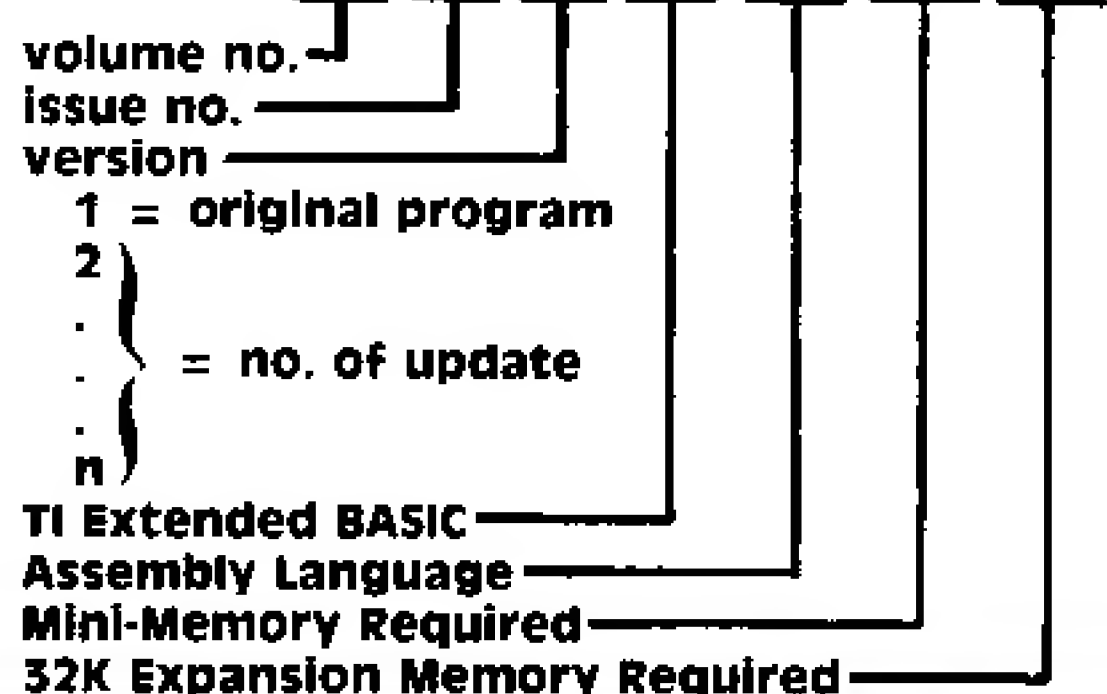
99'er = End of Program or Article

compu-prestidigitation

(kóm-pū-prēs-teh-dī-jeh-tā-shūn) —n. 1. The magical quality of unexpected comprehension that results from presenting technical information about computers in a lively, entertaining, visually attractive and easy-to-understand format. 2. The magical tricks that make a computer sing, dance, and do all sorts of wonderfully useful things.

99'ER VERSION

2 . 7 . 1 . XB AL MM EM





Group Grapevine: News of TI Users Groups From Around the World.

From Sidney, Australia, the active **T.I.S.H.U.G., TI Sidney Home Computer User Group** writes that they provide a Programmer's Crisis Line for members who become stumped in the middle of a program. In their exceptionally entertaining and informative newsletter, the group presents original software, cartoons, articles, and reviews of interest to TI users. Among the humorous pieces in their March issue is an interview with Ivan Computernutskov, a frustrated home computer user in the USSR who is unable to find peripherals or software for his Siberian Instruminski computer. TI users throughout the world will sympathize with Ivan's plight. The *Sidney News Digest* tells us also that Modern Communications was the topic of T.I.S.H.U.G.'s May meeting, and that they are currently soliciting ideas for their biannual, all-day tutorial workshop. T.I.S.H.U.G. is eager to exchange software and ideas with other users groups. Brian Lewis is the acting coordinator for the group, and their address is P.O. Box 149 Pennant Hills, N.S.W., Australia, tel. (02) 848-0956.

The president of the **TI Users Group in Jacksonville, FL** writes that those interested in joining the group can reach them by contacting W.K. Knight at 7266 Bunion Dr., Jacksonville, FL 32222, tel. (904) 778-4507.

MAGNETIC, the Massachusetts Group of Ninety-Nine Equipped TI Computers in Andover, MA holds its meetings on the first Sunday of each month at the Greater Lawrence Tech School, 57 River Road, Andover, MA. Those interested can write to its president, Robert W. Cashman at 692 Lowell St., Lawrence, MA 01841.

The **MSP99 Users Group in Minneapolis/St. Paul, MN** is forming special interest groups on such topics as Investment and Business, LOGO, Assembly Language, Beginning Home Computer Use, and Education. The *Multiplan* package was demonstrated at their April meeting. For information write MSP Users Group, P.O. Box 12351, St. Paul, MN 55112 or call its (newly elected) president, Diane Kavanaugh at (612) 644-5940.

The **9900 User's Group in Moorestown, NJ** provides a software exchange and group library for its members. Those interested in attending a group meeting should contact Michael J. Baker, vice-president. The 9900 User's Group, P.O. Box K, Moorestown, NJ 08057.

And finally, Northwest Florida TI users can now meet kindred spirits at monthly meetings of the **Northwest Florida 99'ers Group**. For more information, contact Jerry L. Carroll 1253 Holliday Dr., Gulf Breeze, FL 32561, tel. (904) 932-4522.

We know you're out there. We've heard rumblings of groups here and there (TI-HOME in the U.K., for instance) who have yet to contact us. If you would like your group's name heard 'round the world, send a note—or better yet, a group newsletter—to the **Users Group Editor, 99'er Home Computer Magazine, 1500 Valley River Drive, Suite 250, Eugene, OR 97401.**

99/4A I have yet to understand. I have the Owner's Manual for the Assembly Language and have the Mini Memory cartridge. To date, I have been unsuccessful in writing a program. Also, I have not been able to comprehend your articles concerning Assembly Language. Unfortunately, there is no material available to explain this subject (to my knowledge).

I might add, I learned Extended BASIC on a DEC PDP-11/34 system. I found the Extended BASIC for the TI 99/4A to be more powerful and easier to convert programs from other systems. In fact, it seems a program entered into the TI takes less memory. For example, I had one program which exceeded the memory of the PDP-11/34 (28K) but did not exceed the memory of the TI (16K). Therefore, it seems the TI utilizes its memory better than the PDP-11/34. Both programs performed the same number of functions. Probably the most significant differences are the functions DISPLAY and ACCEPT which the PDP-11/34 did not have. Instead a subroutine was required to position the cursor and to print the data on the screen at various positions.

Wayne Boody
Pueblo, CO 81001

Wayne, we have rechecked the Matrix Muncher program listing in the magazine, retested it, and we still obtain the correct answers. We suggest you recheck each character of the program as you entered it against the listing in the March issue. Pay close attention to lines 510 through 890.

Regarding 9900 Assembly Language: Assembly Language on any machine is difficult to grasp and very few people have the time and interest to become good Assembly Language programmers. The road to success is paved with much reading, but mostly trial and error. Some of the "Super Language" articles we present are tutorial, some are useful as finished software packages, and some describe "tools" that can be used in Assembly Language programming (such as the memory relocater utility in this issue).

Your comments regarding BASIC on the Home Computer versus the PDP 11/34 are very interesting . . .

Dear Sir:

First, I would like to commend you on your fine magazine.

As I am a "ham" radio operator, I am encouraged to see that other "hams" also own 99/4A's and are interested in related articles and software.

After some investigating, I have learned that Kantronics of Lawrence, Kansas is in the process of manufacturing an interface for the 99/4A which will allow direct hook-up to amateur radio gear permitting use of CW/RTTY/ASCII. This unit will be similar to units they now have for other computers. They told me the unit would be available in April and cost \$99.95.

As a suggestion, it might be informative to carry an article on the compatibility of various models of TV's when used with TI computers, as some sets lack enough width to display all the information. Perhaps there may be some suggestions on how to correct this.

One other suggestion is in the layout of your programs. I think it would be much easier for copying and correcting errors if they were printed on succeeding pages rather than having a program broken up throughout the magazine.

Clarence E. Schwartz
Fond du Lac, WI 54935

Thanks for the information on the Amateur Radio Interface from Kantronics; we will check it out. The problem of TV sets with "overscan" has been a hassle for many owners. Not only does this problem vary between set manufacturers, but also between different sets of the same model!

Our suggestion: If possible, try the TV set with the Home Computer before buying the TV, or purchase a color video monitor built for this purpose.

It may seem that we deliberately split up the program listings, but in truth, we do our best to keep them together.

73's, Clarence.

Dear Sir:

Congratulations for a great magazine! I especially like your articles on games and assembly language programming.

I've picked up some good ideas from short programs sent in by readers and printed in *Letters to the Editor*. Have you considered a regular column devoted to programming special effects?

Do you have any word on the availability of a compiled version of TI Extended BASIC? The increased speed would certainly be appreciated by game and scientific programmers alike.

Keep up the good work.

Bob Clunn
Richardson, TX 75080

Bob, rather than a regular column for special effects, we print special articles such as Sprites in Depth in this issue.

We have not heard of any compilers for Extended BASIC yet . . . Now there is a challenge for some really great programmer!

Dear Sir:

I have owned my 99/4A for about 9 months. May I just say that your magazine is just what I've been looking for in a world I thought was biased against TI computers.

I (like so many other 99/4A owners) own the terrific new space game: *Parsec*. So, when I saw Bob Gagle's *Strategy Corner* article on helpful hints for *Parsec*, I read it with great interest. However, I found a different approach to destroying the Dramites. Here it is:

First, on the earlier levels (not past level three), I find it easier to switch to lift 2 and move to the lower part of the screen. Then, when the Dramites appear, simply move upward and keep the fire key depressed. Since the Dramites follow you wherever you go, they just walk into your fire! Don't do this past level three, however, for you cannot keep the fire button depressed for very long and keep from overheating.

I commend Bob Gagle on a great article that gives beginners and advanced players alike great playing tips. Thanks!

Patrick Bodayle
South Orange, NJ 07079

Patrick, it sounds like you are being unfair to those Dramites! Be a sport, give 'em a chance. Seriously, glad you enjoyed Mr. Gagle's *Strategy Corner*.

Dear Sir:

I am writing to tell you how much I enjoy your magazine, although I wish you would print more TI BASIC programs instead of Extended BASIC and LOGO. And not just game programs, maybe some short ones.

My name is Andy Browning and I am 11 years old and in the 6th grade. And I would like to know a little bit more about the disk drive. Your magazine is funny, informing, and nice. And I'm very glad I subscribed.

Andy Browning
Middleton, OH 45402

We try and balance each issue, Andy, so there is something for everyone. We are always on the lookout for good, short BASIC programs to publish.

To learn about disk drives, read the article entitled *The Drive for Diskettes* in this issue. It is the first of a two part tutorial.

99'er

Send in Your Photos and Anecdotes

Do you have a favorite photograph (color or black and white) featuring an unusual application of your Home Computer? Would you like to share your unusual or amusing anecdotes relevant to Home Computing? *99'er Home Computer Magazine* will pay \$25 for items it publishes. Material chosen will be subject to the same copyright treatment as "Letters to the Editor" as set forth on the Masthead page. No submissions can be returned. Send anecdotes and copies of photos to: Potpourri Editor, 99'er Home Computer Magazine, 1500 Valley River Drive, Suite 250, Eugene, Oregon 97401.

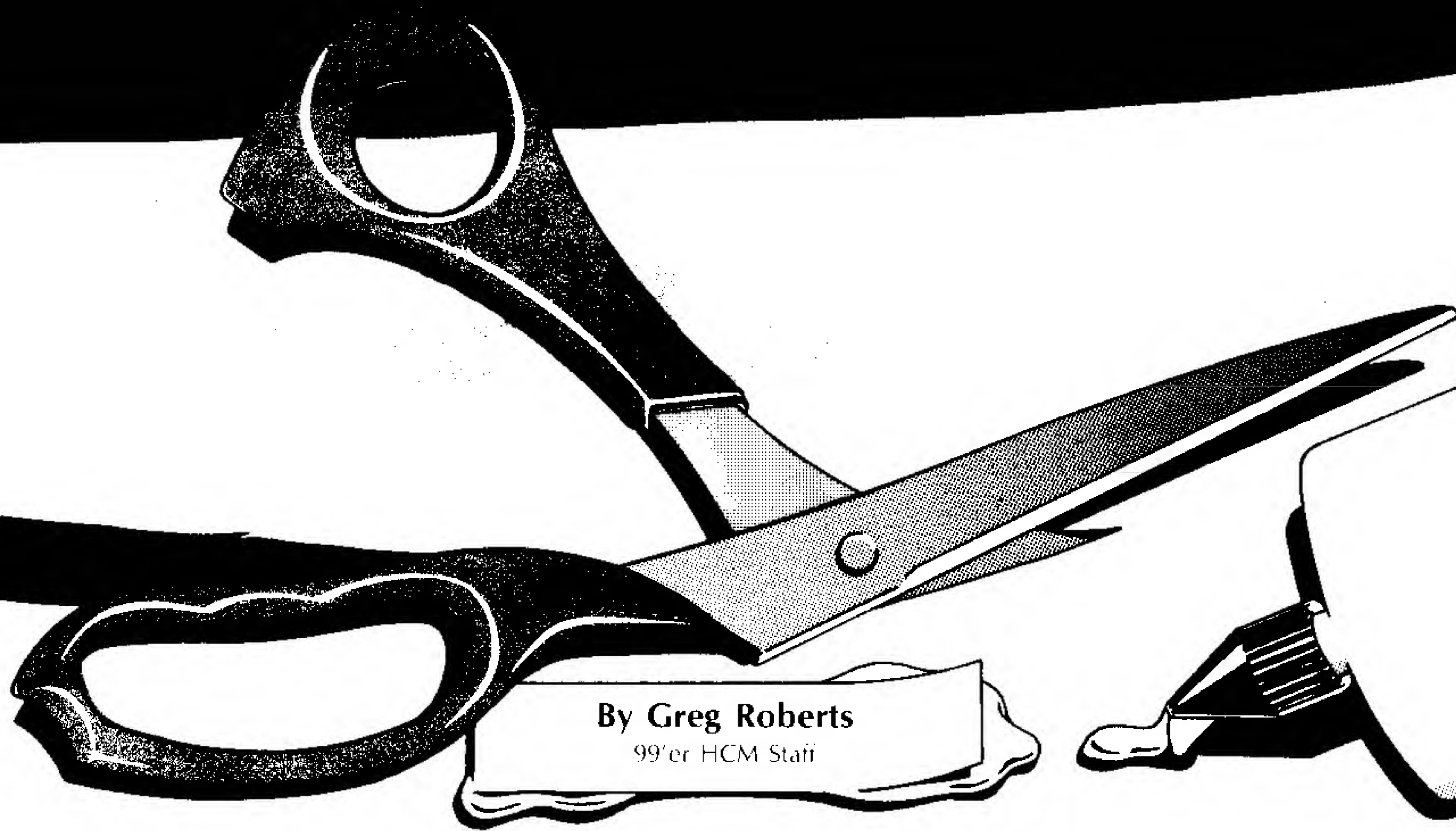
PLEASE HELP

Detach, fold and mail. See other side for instructions.

THANK YOU

IF YOU HAVE ALREADY ANSWERED OUR QUESTIONNAIRE . . . Please check here ☐ and simply return your B.A.R.C. BACK selection.

Think of it—



By Greg Roberts

99'er HCM Staff

Your word processing story may be much like mine: For many years I used a "word processor" that could fit in my shirt pocket; it consisted of an X-Acto knife and a small flask of Elmer's glue. With this primitive kit I could doctor my manuscripts endlessly by slapping down layer upon layer of corrections. The final version, ready for photocopying, looked like a topographic map of the Grand Tetons—intricately landscaped with smudge-slides, ink-bleeds, and fuzzballs grabbed by the glue.

So, when the first word processors came into being, you can imagine how excited I must have been. Well I wasn't. To be shackled to a blinking cathode-ray tube would, I thought, pull a white sheet over the creative process; after all, some of my best stuff came to me while I was pacing the back porch, sitting in a laundromat, or even riding a bus saturated with punk-rock music.

But let me spare you the scenario of my coming around to the blessings of word processing. A hundred such stories have already been scribbled and spit out at the public like a barrage of disaster leaflets dropped from a B-1. Besides, the writer's drama is supposed to take place in a New York apartment, a place this backwoods Oregonian could never tell of convincingly—so let's get down to the facts.

First off, why is there such dread of the green screen? You spend little time at the screen, much less so than at a typewriter, and you can get the same paper copy—that security blanket to cling to. As it turns out, using the computer is so much faster than reworking all those versions on a typewriter, few people still argue whether or not word processing is a good thing—except, perhaps, in remote areas where the few who can write must bag their own goose quills with a flintlock. In other words, anyone who has use for a typewriter would be better off with a word processor.

We are left, therefore, with one major consideration: expense. Does our writing justify buying the computer system? That question will take some analysis.

Who Needs it?

Certain professions have long been able to justify word processors, even with equipment costing thousands of dollars per year to operate. Journalists, lawyers, and mail-order houses produce a flood of forms and letters which can be "personalized" with word processing equipment, creating enormous savings in secretarial work. This kind of word processing, however, has little to do with most home computer users.

The average person's writing may be limited to a few business letters, some school papers, a recipe file, or perhaps

the monthly club newsletter. And yet, even if the quantity of the writing is not large, there is much to encourage the home computer owner to consider word processing. Your computer system may already be very nearly ready for word processing. Those owners who have bought, for one reason or another, the peripheral expansion box, RS232 card, disk



"... anyone who has use for a typewriter would be better off with a word processor."

drive and printer are extremely close to owning a word processor. Depending upon the components in your TI-99/4A system, you could spend anywhere from \$50 to \$1000 to bring it up to word processing status. Your decision to pick up these other peripherals must be based on the quantity and importance of your writing—not to mention the value of a full system for other purposes such as entertainment and home management. In any case, once the system has been brought to such completion, the main concern is software.

The differences among various software packages are considerable, and it pays to study them in detail. Start by keeping in mind two factors: editing capabilities and user friendliness.

You may run across software that promises to do everything for the writer except brew a midnight cappuccino—but if the program isn't accessible, it will soon be gathering dust with your old 45 RPM records. On the other hand, the program which even a child can use may not permit writing on a level higher than the works of Dr. Seuss.

Continued on p. 10

FUTURA

SOFTWARE

The very best in a totally integrated accounting system for your TI99/4A*

- ★ **Announcing...** ★
 ★ **FUTURA POWER** ★
 ★ ... A step into the megabyte world with ★
 ★ your TI99/4A and the MYARC WDS/100 Win- ★
 ★ chester Disk and Controller System. ★
 ★ The WDS/100 brings hard-disk capacity and ★
 ★ reliability to users of the TI99/4A. This new- ★
 ★ est product from MYARC combines a unique ★
 ★ system of 'Directory' management with ★
 ★ Winchester technology for the TI ★
 ★ microcomputer. ★
 ★ FUTURA's Data-Based Business System for ★
 ★ the WDS/100 upgrades your TI99/4A to the ★
 ★ power of a 'mini' at a price that is very cost- ★
 ★ effective for the small businessman. The ★
 ★ WDS/100 is available in 5- and 10- megabyte ★
 ★ models, and we have double-sided, double- ★
 ★ density soft disk for complete back-up. ★
 ★ Orders now being taken. Please write for ★
 ★ more details on this excellent system.

NEW RELEASES

DOOMCASTLE — Graphics adventure game authored by Sam Pincus. A real test of your bargaining powers with Cahmi the Magician to obtain the weapons and potions you need to recover the four Royal Sapphires. Available on cassette at \$19.95. Extended Basic Required.

FLY SNUFFER — The title says 'Fly Snuffer,' but watch out! There are more than just flies in the room. You will need joysticks to move the spray can in position. Six levels of play in this game by Larry Lewis. Requires Extended Basic; available on cassette at \$19.95.

NEWTON'S REVENGE — Excellent Assembler language game by Sam Pincus. Joysticks are optional as you attempt to catch all the falling apples. Miss one and you lose a basket. Cassette version requires Mini Mem; two disk versions available — one for Mini Mem, one requiring 32K and either Extended Basic or Editor Assembler. Choose the version right for you at \$24.95 each.

ORDERING INFORMATION: Payment to accompany order. Add \$1.50 for postage. Allow 10 days for delivery.

Write for complete listing of more than 60 programs for the TI99/4A Computer.

DEALER INQUIRIES INVITED

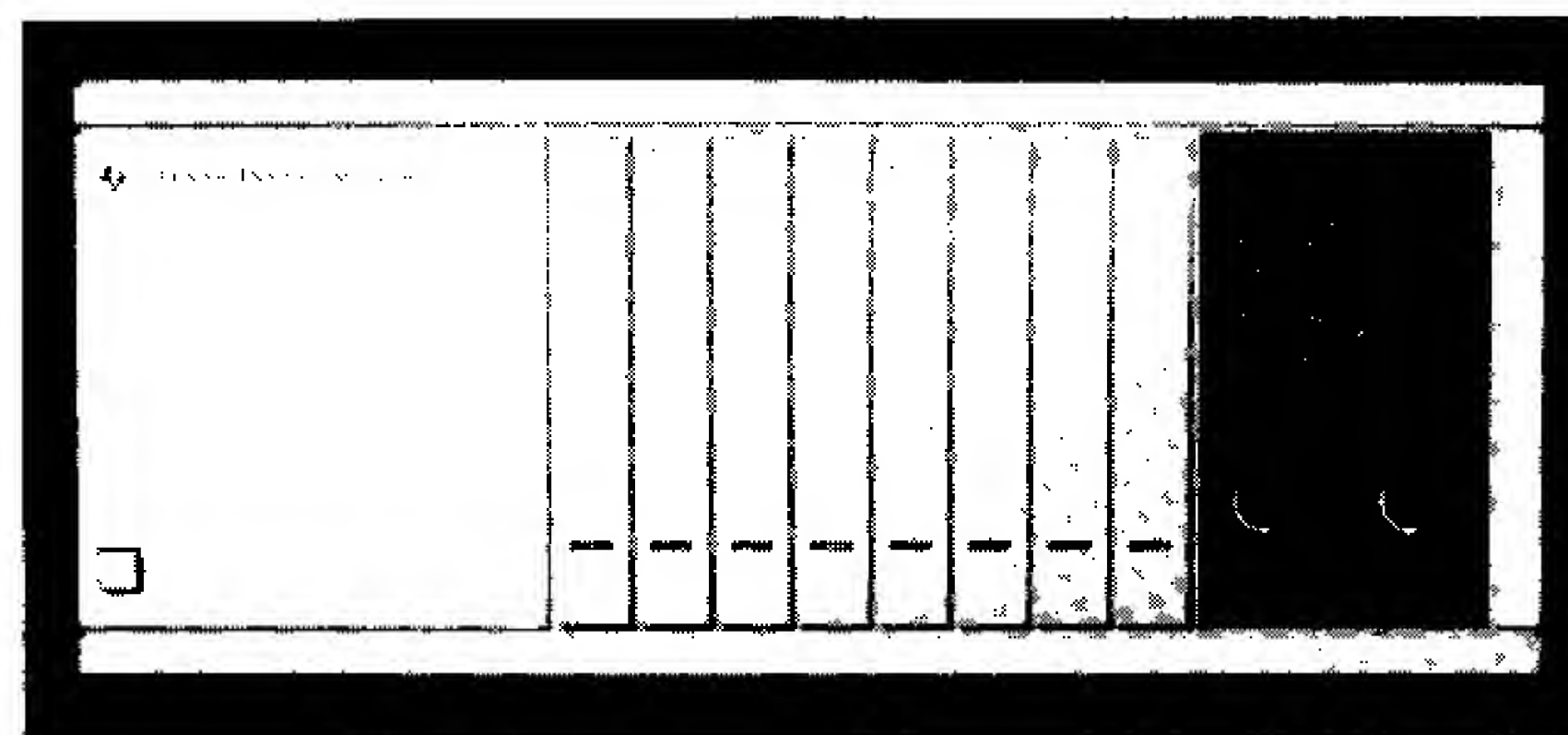


Ehninger Associates, Inc.

P.O. Box 5581
 Fort Worth, Texas 76108
 817 246-6536

MORE SUPER DISK SPECIALS from WESTERN MICRO SYSTEMS

- New half-height, low-power design allows two-drive mounting as pictured
- Run both single & double density
- Compatible with all TI software
- Full 120-day warranty



PRICES

Single-sided, 40track drive	\$215.00
Double-sided, 40track drive	295.00
Filler plate (for one drive)	5.00
Installation kit (required for	
mounting two drives	25.00
External case & power supply	65.00

WMS/2760 S. Havana, Suite S
 Aurora, CO 80014

Shipping included for pre-paid
 Visa, MC, COD, 4% handling
Order line, 1-800-641-3885
Technical info (303) 337-5909

Be Wary

How will you know when a software designer has cooked up the right recipe for your *particular* needs? You can start by reading the various company brochures (with wallet firmly buttoned down, I would advise)—but the real truth will come out in the user's manual. It should show a program that will let you start writing with just a few simple commands—with a complexity that grows, chapter by chapter, until you can compose text under any kind of format. We can compare the ideal word processor to the book, Huckleberry Finn: Anyone can appreciate it immediately, yet it has additional circuitry for those who choose a path through denser thickets.

Workspace

A major concern is the accessibility of the page for editing. The TI monitor cannot display an eighty-character line in the same way a large, stand-alone word processor can. If you are used to typing lines of this length, you can view your work under several formats. Some programs scroll up just one line at a time for reworking, while others let you fly all over the page with your cursor. The TI system, using its *TI-Writer* Command Cartridge, lets you view your text on "screens" that shift back and forth horizontally at the touch of a key. It offers easy access to the text. For example, what if you forget to write in an important line, and don't realize it until many pages later? This program, with just a couple of key presses, lets you open up the text, change it, and close it right back again, like sneaking a tomato slice into a grilled cheese sandwich before the whole thing melts into a blob.

Similarly, you might wish to find and change a word you know you wrote a few pages or a few days ago—say the word *thermos* which you find you must go back and capitalize. In such a case, you'd like a word processor command capable of *searching* for that word. Or you may wish to change a certain word in many locations throughout the text. For example, our game designers here at *99'er Home Computer Magazine* sometimes write a complete description of their latest effort, and then decide—late in the game—to

FREE CABLE*!

WITH THIS **CRAIG**
CASSETTE PLAYER

\$54⁹⁹*

PLUS \$ 3.50 SHIPPING

8 DELUXE FEATURES
(1) AUTOMATIC SHUTOFF
(2) 3-DIGIT TAPE COUNTER
(3) PIANO KEY OPERATION
(4) SLIDE-OUT HANDLE
(5) CONDENSER MICROPHONE
(6) TAPE-EJECT BUTTON
(7) LED BATTERY CONDITION RECORD INDICATOR
(8) BUILT-IN AC ADAPTER

PLUS:
SPECIAL CIRCUITRY RECHARGES THE MONEY-SAVING NICKEL CADMIUM BATTERIES

FULL ONE YEAR WARRANTY

**NOVA
DATA**

HAVE COMPUTER-
WE'LL CABLE

SEND CHECK OR MONEY ORDER ONLY TO:
NOVADATA SYSTEMS INCORPORATED
1104 SUMMIT AVENUE
PLANO, TEXAS 75074
TELEPHONE 214-423-6694

* TEXAS RESIDENTS ADD 5% SALES TAX ALLOW 3-4 WKS DELIVERY



* FREE
CABLE
TO RUN THIS
RECORDER ON A
TI 99/4 HOME
COMPUTER
(A \$14.95 VALUE)

change its name. No matter; they can punch *Blobs* for *Bombs*, and the program will automatically make that change throughout the text. In fact, whole paragraphs can be interchanged or repeated at different locations.

A similar substitution technique is the mainstay of form letters—the kind you get from politicians and from some busy relatives at Christmas. If you want to pay them back in the same friendly way, make sure your software is up to the job.

“... compare the ideal word processor to the book, *Huckleberry Finn*: Anyone can appreciate it immediately, yet it has additional circuitry for those who choose a path through denser thickets.”

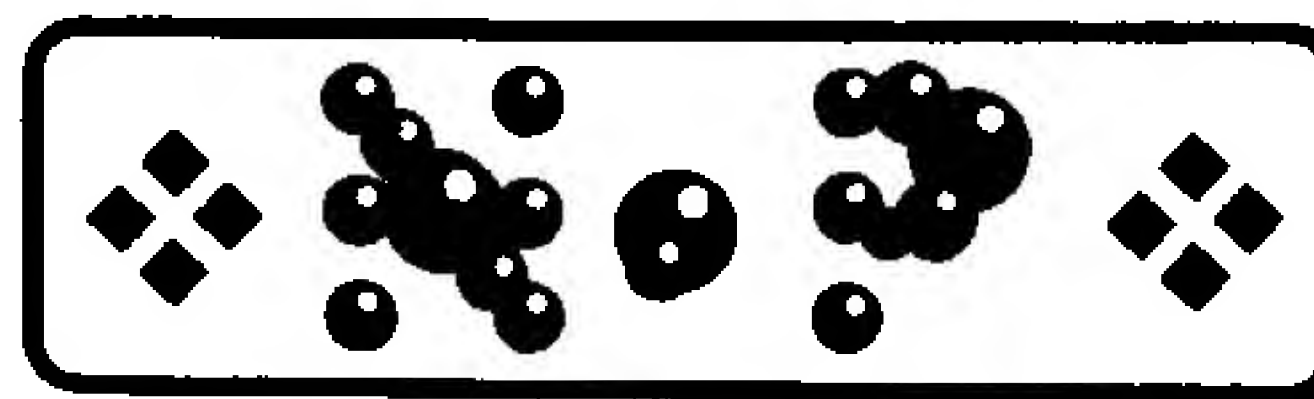
Forms and Norms

A good program will let you choose from a wide variety of formatting options, after your text has been entered and edited.

Some first-rate designs will not only offer great leeway in formatting, they automatically adjust the right margin (*right justification*), just like the typesetting machines used in newspaper or magazine production.

A great convenience is a program that will *wrap* ends of lines, so that they form a new line without breaking words. Too, you may be interested in a *center text* feature that lets certain items, such as tables or poems, center automatically in the text, regardless of margin justification.

Continued on p. 39

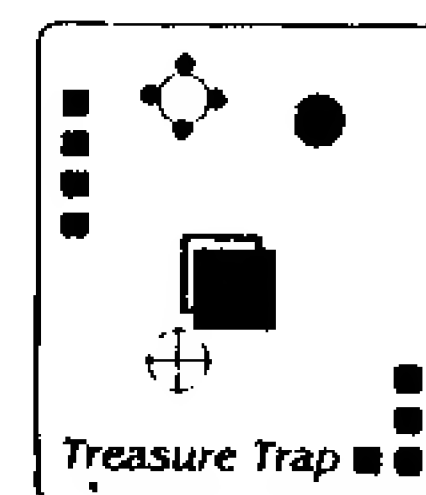


New on Sale from NOT-POLYOPTICS
The 99/4(A) Program People

Five New Games for the 99/4(A)

In TI Console Basic -

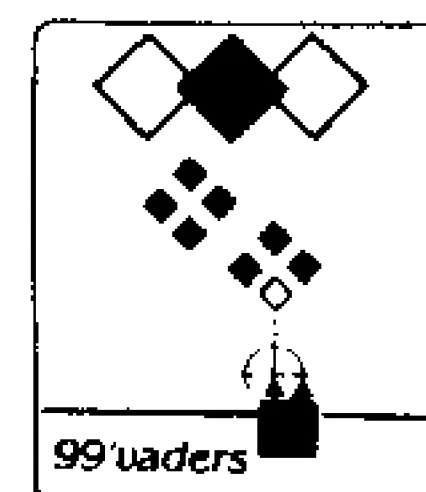
Treasure Trap An exciting new concept in graphic adventure. Break into the Builders' Planetoid and explore myriad rooms on your quest for High Tech treasure. A different adventure each time you play!



99'vaders All the finger-slamming adrenalin of the arcade favorite at half the cost. Fight back wave after wave of galactic kamikaze aliens from the last outpost on Earth.

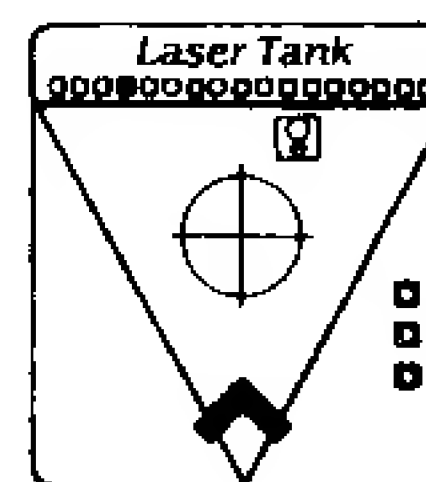
In TI Extended Basic -

Laser Tank On a battlefield of the future maneuver your Coherent Infra-red Equipped Vehicle (CIREV) into position for the lightning quick laser duels with similarly equipped enemy tanks. Chase and engage in the battle zone.



Waldoball Androids are pitted against Robots in this soccer game of tomorrow. Combines the action of team sport with the machine cool of pinball.

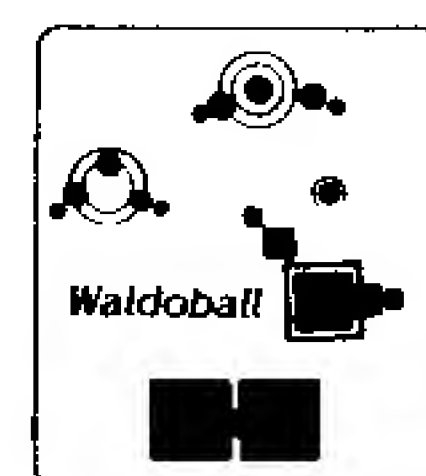
Arcade Monopoly Play this all time favorite with full graphic representation on your screen. Choose between regular and arcade versions. The arcade game adds quick movement, rolling obstacles, and the ability to blitz opponents' properties with super projectiles.



And don't forget the games that made Great strategic games such as *Khe Sanh*, *Sengoku Jidai*, *Ant Wars*, *Ships!*, and *Hordes*. Great action games like *Tickworld*, *Maze of Ariel*, and *Cars & Carcasses 2*. Great board games like *Advance* and *Crosses*. And of course the best selling *Winging It* flight simulator and *Starship Pegasus* game of CETI.

A New Peripheral that will change how you interact with your computer!

The Texas Light Shooter A photoreceptor gun that plugs into the joystick port of your 99/4(A) to allow you to shoot at targets on the screen. Included with the Light Shooter are complete instructions and a shooting spree game on cassette. Our supply will be limited initially so hurry ordering this item.



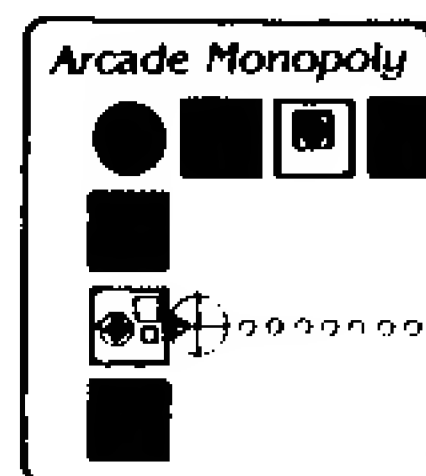
NOT-POLYOPTICS

13721 LYNN STREET, SUITE 15
WOODBIDGE, VIRGINIA 22191
(703) 491-5543

NAME _____
ADDRESS _____

\$18.00
[] Starship Pegasus [] Khe Sanh [] Sengoku Jidai [] Hordes [] Ant Wars
\$15.00
[] Laser Tank [] 99'vaders [] Arcade Monopoly [] Ships! [] Winging It
\$13.00
[] Treasure Trap [] Waldoball [] Maze of Ariel [] Tickworld [] Advance
\$10.00
[] Crosses [] Cars & Carcasses 2
[] Texas Light Gun \$30.00

10% discount on orders of \$20 or more. Total of Order _____
Virginia Residents add 4% sales tax.
\$1.00 Shipping for Light Gun.
© 1983 by



PROMETHEUS SOFTWARE

We Have The Finest
Quality Software
Available For The
TI99/4
Home Computer

Strategy Games

CHECKERS
REVERSI
CRIBBAGE
WARI
GO-MOKU
BLACKJACK PROFESSOR

Action Games

WAR OF THE WORMS
ASTEROID MINER
FROGLEGS
HELICOPTER ATTACK

Send today for a
FREE CATALOG
of all our programs!

Dealer Inquiries
Invited

* * * * *

WANTED
Innovative Software
in the following
categories:

- ENTERTAINMENT
- BUSINESS APPLICATIONS
- UTILITIES
- EDUCATION

Let Prometheus Software take over the headaches of publishing your software. We are looking for quality programs in basic, pascal, or 9900 assembly code. Just send us a complete description of the software package. Our royalties are very competitive.

**PROMETHEUS
SOFTWARE**

413 Lowell Ln.
Richardson, TX 75080

WORD PROCESSOR

MARKET BASKET

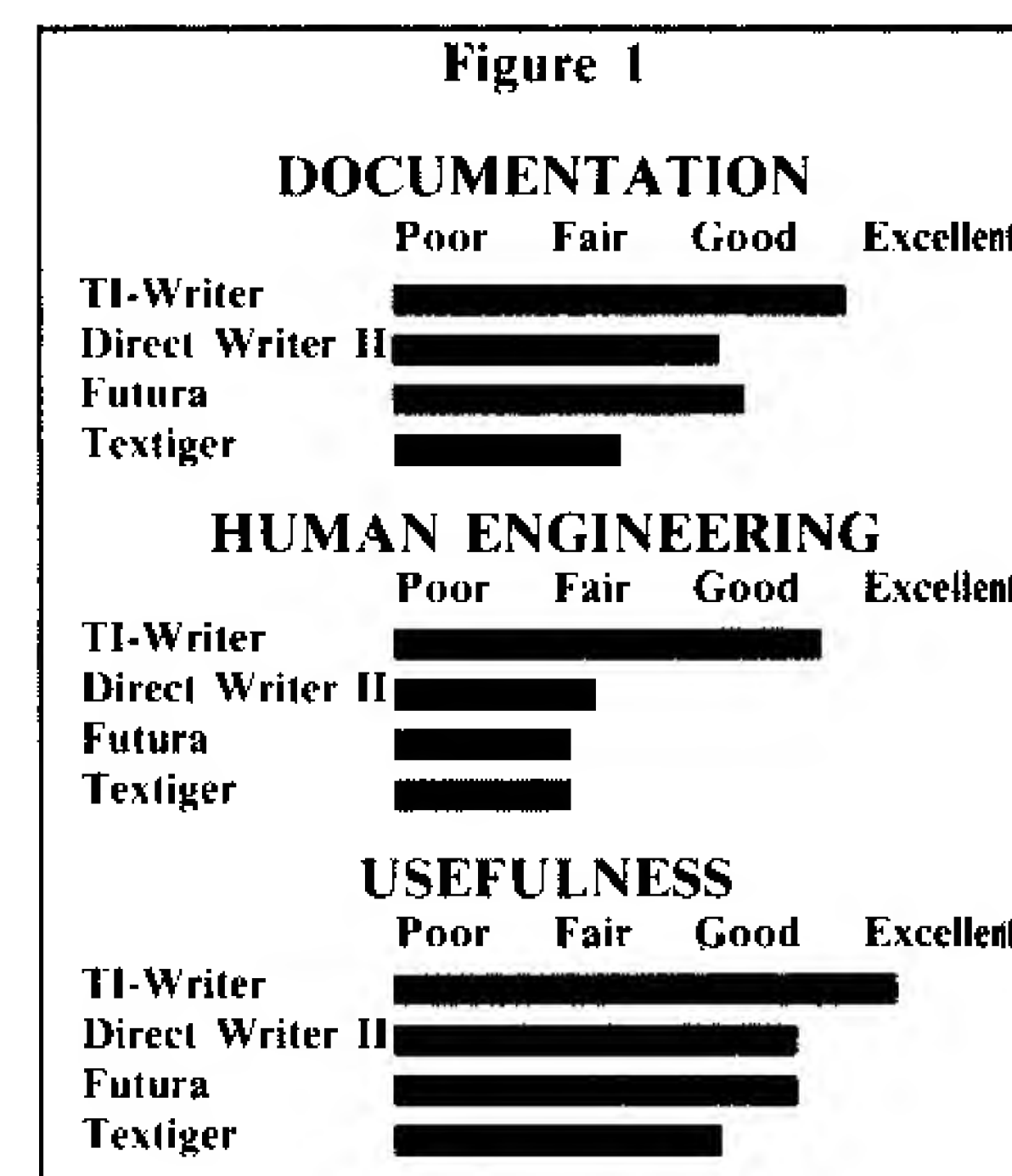


By David G. Brader

After playing exciting video games on their Home Computers for a few weeks, many owners seek out more meaningful uses for the TI-99/4A. Word processing is often the choice—and so the search for a program begins. If you are such a person and you are not sure which way to turn, scanning the data in this article and deciding what factors are important to you will make your shopping trip more satisfying.

So, what are the factors you should consider? First, give some thought to the types of applications you are likely to have for a word processor (simple letter writing and note keeping, or major tasks such as writing a novel). Knowing this will help you decide the speed and capacity that your system should provide. This, in turn, will affect the amount of money that you are likely to spend.

No matter what you plan to write with the word processor, a prime consideration is its *ease of use*. This generalized quality may be broken down into three other areas, which we rate in Figure 1: *Documentation*, *Human Engineering*, and *Usefulness*. To judge the *Documentation* of the software package, we looked for clarity, completeness, meaningful examples, and organization. *Human Engineering* refers to how easy it is to access the features of the software. Systems that required you to consult the manual or memorize key sequences in order to perform common procedures (tabulate, set margins or modify text) received a low score in this area. *Usefulness* addresses the features of the software and the frequency with which they may be used. Some



fancy features are only useful to a select few while others may be used by every one.

Figure 2 simply shows what equipment is needed to utilize the software. Note that the Textiger software package can be used on a minimal system. This is nice for just "getting your feet wet," but it probably would not be acceptable to those users who plan to do a lot of writing. Also, note that the TI-Writer package comes with special Command Cartridge and doesn't require the Extended BASIC cartridge.

The last illustration (Figure 3) lists several features and shows which of the four packages offer them. This list does not represent every feature the program offers—we are focusing on only the most

Figure 2
Minimum Equipment Required to Support Software

	TI-WRITER	DIRECT WRITER II	FUTURA	TEXTTIGER
TI-99/4A	X	X	X	X
MONITOR	X	X	X	X
EXTENDED BASIC		X	X	X
DISK CONTROLLER	X	X	X	
DISK DRIVE(S)	X	X	X	
32K MEMORY EXPANSION	X	X	X	
RS232 INTERFACE	X	X	X	
PRINTER	X	X	X	X

Figure 3
Features

	TI-WRITER	DIRECT WRITER II	FUTURA	TEXTTIGER
FULL SCREEN EDITING	X			
AUTOMATIC WORD WRAP	X			
RIGHT JUSTIFICATION	X	X	X	X
AUTOMATIC LINE CENTERING	X	X	X	X
FIND STRING FUNCTION	X	X	X	X
TEXT BLOCK HANDLING	X	X		
TEXT LINE HANDLING	X	X	X	X
TEXT CHARACTER HANDLING	X	X	X	X
LINKING FILES TO PRINT	X	X		X
TEXT FORMATING	X	X	X	X
SCREEN FORMATED AS ON PAPER	X	X		
MAILING LIST INTERFACE	X		X	
LOST DATA RECOVERY ("OOPS KEY")	X			

sought-after functions. Neither is this an exhaustive survey of the word processing marketplace. Time and space limit us to what we feel is a representative cross-section.

TI-Writer—The TI-Writer package, (PHM3111) which includes the TI-Writer Command Cartridge, program diskette and manual, comes in a large, notebook style binder. The suggested retail price is \$99.95 (It is available from Texas Instruments dealers).

Direct Writer II—This Extended BASIC software package is on diskette and comes with a manual of instructions. It has a suggested retail price of \$66.00 and is available from Dynamic Data & Devices, P.O. Box 912, Stafford, Texas 77477.

Futura—The Futura Word Processor, another Extended BASIC package, is offered by Ehninger Associates, Inc., P.O. Box 5581, Fort Worth, Texas 76108. It also comes on diskette with a manual of instructions. Suggested retail price is \$149.95.

Textiger—Offered for a suggested retail price of \$59.95, this Extended BASIC word processor is designed for use with or without the 32K memory expansion and disk drives. Available from Textiger, 24433 Hawthorne Blvd., Torrance, California 90505, it can be purchased on disk or cassette and comes with a brief manual of instructions.





**EXTENDED
automatic
tone dialer &
directory program**

PLUS
CHECKERS GAME
&
ALPHA SORTING &
DUPLICATE ELIMINATING
PROGRAM
\$50.00 VALUE
ONLY \$19.95 POSTPAID

GOOD NEWS SERVICES
DEPT M
4859 SO. SPENCER ST.
SEATTLE WA 98118

**SATISFACTION
GUARANTEED!**

1

Source

For all your Third party independent Software at Discount Prices! Free Monthly Bulletin, Price quotes on full line of products for the TI computer. Plus ALL in stock orders shipped the same or next Business day. Just Call or Write

Music Workshop
59 E. Tioga St
Tunkhannock, PA 18657
[717] 836-4522

Visa & Master Card Accepted
Specials-Joystix Adapters-Allows use of Atari compatible units-\$14.95
Wico-Red Ball controllers-\$27.95 ea.
Add \$2.00 postage-6% Tax for PA residents

SUPER CATALOGER accepts up to 550 filenames from as many as 63 disks and produces a sorted catalog on any printer. And it's fast too! . . . an Assembly Language subroutine sorts 200 filenames in six seconds! Requires: TI-Extended-BASIC, memory expansion, disk drive and printer. Virginia residents add 4% sales tax.



FOUNDATION PRESENTS . . .

THE 128K MEMORY CARD

To make a great memory card, begin with a quality design by our MIT-trained engineering team. Then add the finest components—prime integrated circuits from the top manufacturers.

Assemble each board with meticulous attention to detail and crafting. Then subject the board to intense testing. Only after this does a memory card qualify for the Foundation name.

We've been shipping our 32K Memory Card in volume, and customers across the country have been calling to praise our product. As with TI's 32K card, the Foundation Memory Card comes in its own metal case and it plugs into your Peripheral Expansion Box. It runs the same programs as the TI card, including Logo, Pascal, Extended Basic, and Assembler.

If the 32K Memory Card does not meet your needs, our **128K Memory Card** is now available.

And finally, we take pleasure in announcing our **32K Stand Alone Memory Card**. The 32K Stand Alone Memory Card plugs directly into your TI computer. You do not need a Peripheral Expansion Box for its use. Otherwise, it works just like our better-known 32K product. It is also now available for shipment.

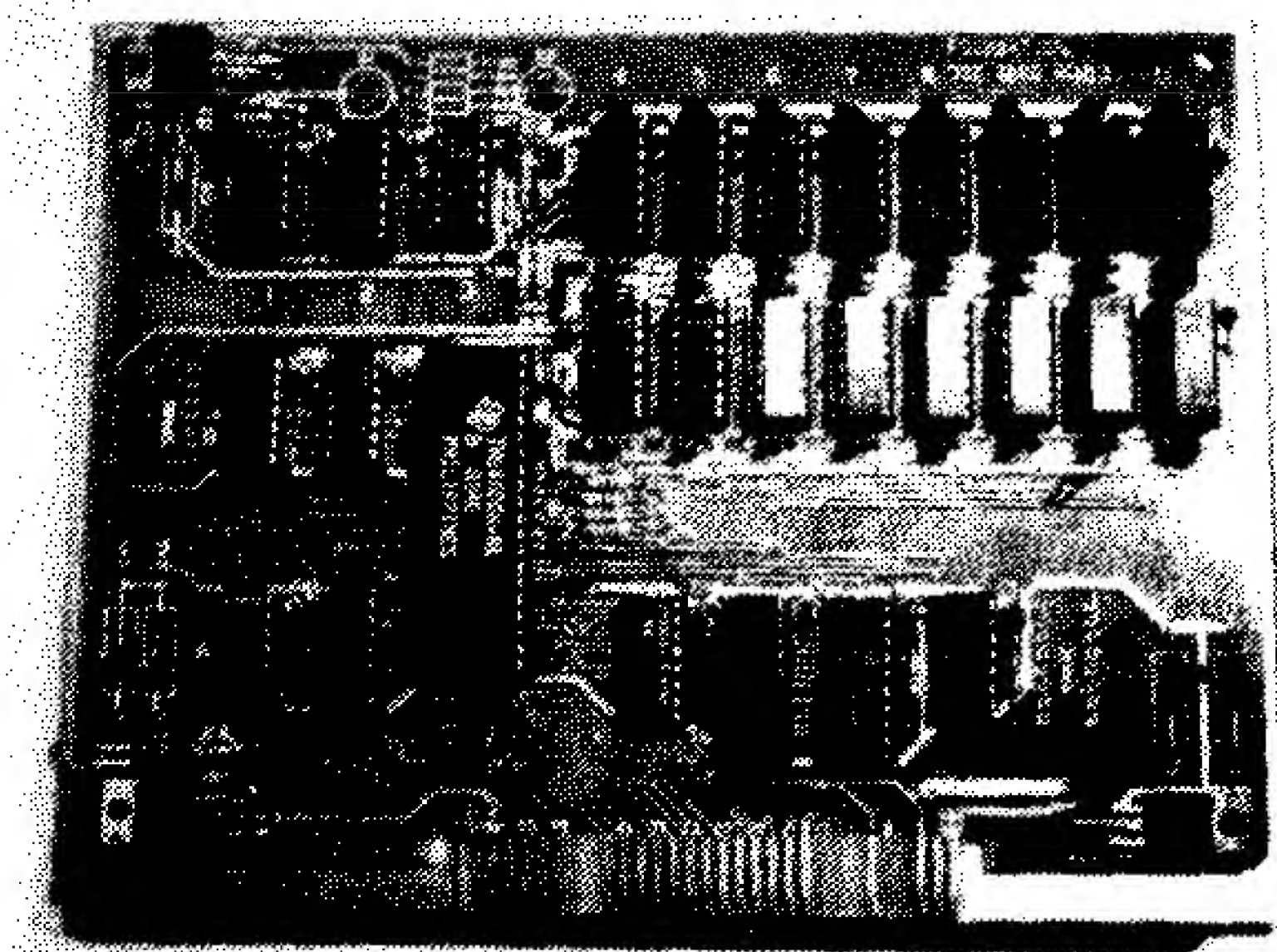
Please note that a letter or a phone call will reserve a card for you even if you can't take immediate delivery.

3 month warranty.

Prepaid/C.O.D. Add 3% shipping.

Calif. residents add 6% sales tax.

Add 2-3 weeks for delivery.



So now you have a choice* —

- The 32K Memory Card at \$150
- The 128K Memory Card at \$220
- The 32K Stand Alone Card at \$160

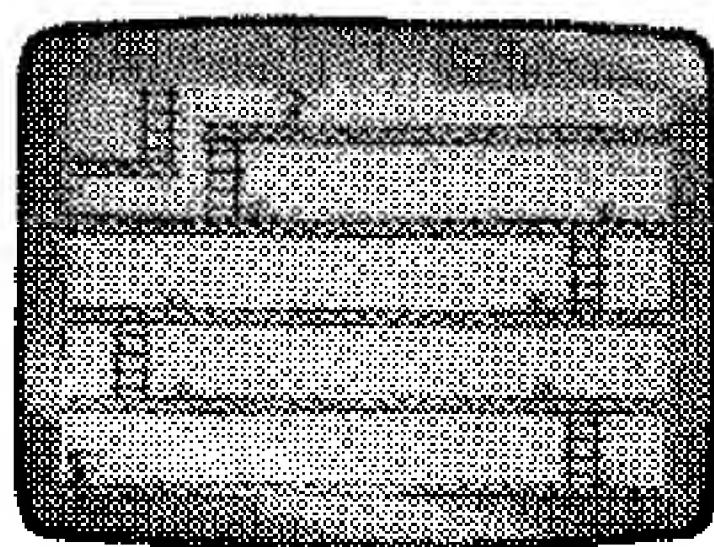
FOUNDATION

74 Claire Way, Tiburon, Ca. 94920
(415) 388-3840

* Introductory Price — Order Now!

SOFTWARE FOR THE 99/4(A)

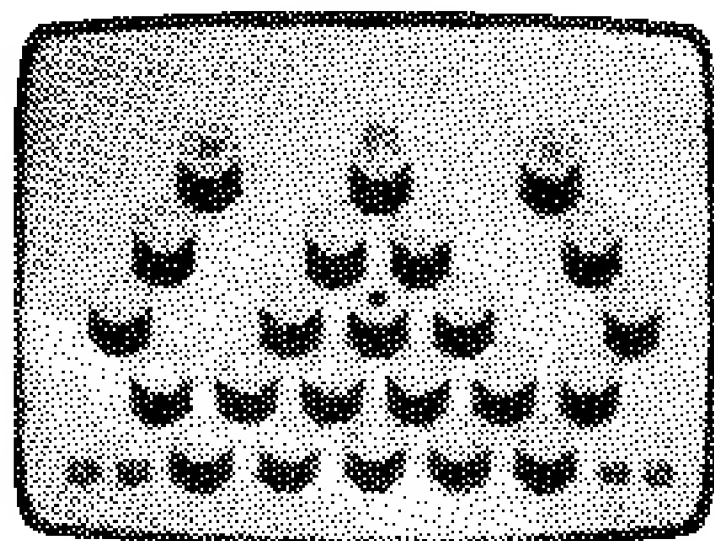
GAMES PAK/III



KONG

Help KONG fight his way to the top of the warehouse, avoiding rolling barrels and trap-doors, to save Roxanne from the bomb set in motion toward her by the villainous Igor. Six different screens. Action from all directions. Joysticks required.

Cassette or Diskette\$15.00



BOUNCER

BOUNCER bounds from one trampoline to another, scoring points for clearing off the squares. He must avoid the arrows which will burst him. Six different screens, each more difficult than the last. Uniquely coordinated sprites, graphics and sounds make BOUNCER so like a real arcade game, you will wonder why we didn't provide a slot for the quarters. Joysticks required.

Cassette or Diskette\$15.00

ROMEO

ROMEO has a goal. But he must traverse the blazing desert dunes, swim a stream infested with alligators and sharks, and bolt through treacherous terrain for his just reward. This is enough action to wear out a good set of joysticks!

Cassette or Diskette\$15.00

GAMES PAK/II

ARTILLERY

The opposing force must be destroyed by determining angle and force of each shot. An ever changing wind complicates matters. Play is between two players or one player against the computer. Simulates actual ballistic trajectories.

Cassette or Diskette\$9.95

DE-CYPHER

An encrypted message is displayed and guesses change all corresponding letters to the guess. Includes a help feature. Comes with 50 messages which can be changed or more can be added.

Cassette or Diskette\$9.95

PUZZLE 15

Move alphabetic squares (A to O) into the single empty slot in an effort to arrange them into order. The computer keeps track of the number of moves taken to solve the puzzle and scores of previous games are displayed for comparison. Multiple squares may be moved when appropriate.

Cassette or Diskette\$9.95

FLIP CHECKERS

Outsmart the computer or an opponent by getting all checkers flipped to your color. Computer determines its moves pleasingly fast. A board game with no pieces to lose. Joysticks required.

Cassette or Diskette\$9.95

GAMES PAK/I

FROGGY

Jump FROGGY across 10 lanes of traffic then across 6 logs; keyboard or joysticks. Fabulous sprite action!

Works Like A Real Arcade Game

Cassette or Diskette\$9.95



EXTENDED BASEBALL

Joystick control of the pitcher and the batter, and individual batting averages that specifically effect the batting algorithm. Multi-base and multi-runner plays. Joysticks required.

Cassette or Diskette\$9.95

GORIA PESTULITIS

Joystick control of a laser sight or inertia influenced space mines to shoot down the invading Gorfians. Joysticks required.

Cassette or Diskette\$9.95

EXTENDED HANGMAN

Quick graphics, music, color, speech (optional) and sound are added to keep the players entertained. Includes 580 words of 4 to 9 letters in length in easy, medium, and difficult groups.

Cassette or Diskette\$9.95

TIC-TAC-TOE

Quick set-up and quick decision making at four levels of difficulty. The levels avoid the frustration of the novice never having a chance to win, while the most difficult level will challenge the pros.)

Cassette or Diskette\$9.95

TYPWRITER*

a complete WORD PROCESSOR

Now With Right Justify

Any Input/Output storage of text — disc, cassette, cassette input/disc output, or vice versa.

Complete text *Editing* — by cursor control; including insert & delete lines, partial print, printer halt or abort without text loss, page FWD & BKWD, and more.

Complete *Software Control* of Printer (depending upon its capabilities) — for enhanced print, underlining, formatting, 28 to 254 characters per print line, etc.

No Special Equipment — monitor, console. Extended Basic module, C or D, printer.

Comes with a 20 page instruction booklet.
Cassette \$32.00 Diskette \$35.00

NAME-IT*

DATA BASE for: Mail Lists, Labels, Files

Records: 250 records per diskette consisting of up to nine 28-character items per record.

Prompts: user designated prompts.

Complete *File Sort*: 250 records in 100 Seconds.

Search; Pre-set; print labels & lists.

Includes a FORM LETTER program that uses NAME-IT data in TYPWRITER generated form letters.

Cassette version differs from disk version.
Cassette \$32.00 Diskette \$35.00

*Should you decide to up-grade to the TI-WRITER module, TYPWRITER and NAME-IT data can be converted for use by that module. NAME-IT alone, will generate 250 TI-WRITER form letter records.

TI-WRITER is copyrighted software of Texas Instr.

SCREEN/DUMP

Print the screen on a dot-matrix printer. Does not require extra memory! Disk version is simple to use. Cassette version requires mild programming knowledge.
Cassette or Diskette\$12.00

MASTER CATALOG

A master index of your disks and programs. Being readied at press time.

Should include: Up to 100 disks can be catalogued with up to 100 programs each — a total of 1000 programs. Look-up time from a cold start: under one minute! Look-up time from a running program: 15 to 25 seconds! Sort time: none.

List on screen or a printer in alphabetical order by program name or disk name.

Diskette (only)\$15.00

ORDER FORM

EXTENDED BASIC MODULE REQUIRED FOR ALL

GAMES PAK/I\$26.95 (C or D)

(Froggy, Extended Baseball, Gorfia Pestulitis, Extended Hangman, Tic-Tac-Toe)

GAMES PAK/II (Artillery, De-Cypher, Puzzle 15, Flip Checkers)\$26.95 (C or D)

GAMES PAK/III (Kong, Bouncer, Romeo)\$26.95 (C or D)

TYPWRITER (word processor)\$32.00 (C price)

NAME-IT (data base/mail list)\$35.00 (D price)

SCREEN/DUMP (printer required)\$12.00 (C or D)

MASTER CATALOG\$15.00 (D only)

INDIVIDUAL GAMES: (C or D)

<input type="checkbox"/> Froggy	<input type="checkbox"/> Extended Baseball	<input type="checkbox"/> Gorfia Pestulitis	<input type="checkbox"/> Extended Hangman	<input type="checkbox"/> Bouncer	<input type="checkbox"/> Kong
<input type="checkbox"/> Tic-Tac-Toe	<input type="checkbox"/> Artillery	<input type="checkbox"/> De-Cypher	<input type="checkbox"/> Puzzle 15	<input type="checkbox"/> Romeo	<input type="checkbox"/> Flip Checkers

Send this form or a substitute with check or money order to:

Extended Software Company
11987 Cedar Creek Drive
Cincinnati, Ohio 45240

Total Individual Games:	\$	
Shipping & Handling via First Class Mail (or Air Mail Overseas):		Included
Sales Tax:		Included
Add \$2.00 if C.O.D. (U.S. Mail Only):	\$	
Check or money order or C.O.D. Total:	\$	

Cut Here (may be copied or substituted)

IF YOU ARE NOT COMPLETELY SATISFIED, YOU MAY RETURN THE PROGRAMS (and instructions) WITHIN 15 DAYS FOR A FULL REFUND OF YOUR PURCHASE PRICE.

All programs operate on the 99/4 & 99/4A. Specify model for Typewriter.

A detailed catalog is available free. Circle "FREE" on the order form or send a letter or postcard.

Dealer inquiries welcome

Programmer inquiries invited.

EXTENDED

A Generalized Filing Program

By Brent R. Cromley

235 Parkhill Drive
Billings, MT 59101

Most lawyers keep up to date by reading current publications and taking note of important cases for future reference. These notes can be hard to keep track of, especially as they accumulate over the years. The original purpose of the program presented here, *Findex*, was to provide a filing system for summaries of cases that are of particular interest to lawyers, but it can easily be modified for a variety of information-filing uses. For example, with minor changes (see Figure 1), the program is suitable for summaries of magazine articles. In fact, any professional who must read journals to keep up to date with new developments could benefit from an adaptation of this program.

Case in Point

The program is, for the most part, self-explanatory. You must first establish a file by using option 3. Then you can enter and index law cases under one, two, or three 4-letter categories. If a case requires more than three categories, it can be entered twice. The computer asks for a brief explanation of each new category, then files it immediately, with up to thirty in any one file. If more than thirty categories are required, they should be stored on several disks, each confined to a limited area of law. Figure 2 includes a sample of ten categories such as might be used in a trial practice.

Using option 2 (retrieval), the operator can review cases filed under any category. Option 4 (edit) displays all cases on the screen, one by one, and lets you either delete or retain the case in the file. Option 5 shows all categories in a file, allowing deletion of unwanted ones. The Category subroutine (lines 2720 to 2860) is also available during the entry and retrieval of cases, but without the edit function.

Definite Articles

Adapting the program to other uses is fairly simple: You merely change the lines which display words on the screen. For example, to create a file of magazine article summaries, the word "case" should be replaced by "article." The only substantive change would be to take out lines 1050 to 1080

which input the state of the law case. This allows a description of up to thirteen characters instead of ten (Line 1120). Line 1140 should then be modified by replacing the numeral 10 with 13 so that the number of characters in the top line stays at 28.

Findex will run in either TI BASIC or Extended BASIC. The original disk program was writ-

ten in Extended BASIC with liberal use of the DISPLAY AT and the ACCEPT statements. LINPUT can also be used in Extended BASIC on line 1110 and 1200, thereby allowing the use of commas.

Figures 1 and 2 are examples of printouts from the *Findex* program.

BASIC

Listing begins on p. 60

Figure 1—Magazine Article File

LOGO-PROC-NONE-1:5 99'er 58-"AVOIDING TURTLE TRAPS"; HENRY GORMAN. TIPS ON EFFICIENT LOGO PROGRAMS. EXAMPLES OF STUDENT PROGRAMS.

The article named appears on page 58 of Volume 1, Number 5, of *99'er Magazine*.

GAME-XBAS-GRFX-1:3 99'er 25-DOGFIGHT; W.K.BALTHROP. AIRPLANE FIGHT GAME FOR TWO PLAYERS. EXCELLENT GRAPHICS ON PLANES.

This game, entitled *Dogfight*, is found on page 25 of the third issue of *99'er Magazine*.

Category explanations for the above examples (for articles from computer magazines):

LOGO—LOGO language
PROC—programming aids
GAME—game programs
XBAS—Extended BASIC
GRFX—examples of graphics

Figure 2—Law Case Retrieval File

SLIM-WRTY-PLIA-MT-511FS 224-
SCHLENZ V DEERE (1981) P.I. ACTION BASED ON U.C.C.
WARRANTIES CARRIES U.C.C. STAT/LIM, NOT TORT.

This tells you the following: The case, entitled *Schlenz v. Deere*, is found in volume 511 of the Federal Supplement, page 224. The holding summarized is that a personal injury action based upon warranties under the Uniform Commercial Code, has a statute of limitations as provided for in the Uniform Code, as opposed to the limitation period normally associated with personal injury actions.

PLIA-CNEG-SLIA-OR-642P2 624-
SANFORD V CHEVROLET (1932).
PL'S MISCONDUCT & CON/NEG
BARS RECOVERY IF GREATER
THAN D'S FAULT.

This case is entitled *Sanford v. Chevrolet* and is reported in volume 642 of *Pacific Reporter Second*, at page 624. The holding is that misconduct by a plaintiff in strict liability action may prevent his recovery if it is found to be greater than any fault on the part of the defendant.

Examples of law case categories:

NEGL—negligence
SLIA—strict liability
PLIA—products liability
SLIM—statutes of limitation
WRTY—warranty
INST—jury instructions
DISC—discovery
SUMJ—summary judgment
CNEG—comparative negligence
CFLT—comparative fault
DEAD—wrongful death

Eastbench Software Products

Quality software for the
TI-99/4 home computer

Now available, 18 programs in ASTRONOMY including these new titles: Lunar Coordinates, Lunar Phases, Position of Comet Halley, Comet Halley Ephemeris, Daylight, Planetary Orbital Elements, the Calendar Program and many many more. Only \$16.95 for cassette and listing.

FINANCIAL programs include Non-Profit Income & Expense Report (\$34.95), Personal Income & Expense Report (\$27.95), Financial Statement Analysis (\$34.95) & Home Budget II, III & IV (for BASIC, X BASIC, & X BASIC plus disk) at \$27.95.

Available UTILITY programs include Automatic Filer at \$37.95 (disk), computerized Telephone Directory (\$24.95), DiskMaster (for cataloging your disks) \$17.95, Pretty Print (for formatting your program listings) \$17.95 & Talking Bartender (\$24.95 disk).

EDUCATION listings include Higher Math Made Simple (a package consisting of routines for functions, matrices and calculus), Blackjack Strategy (test your blackjack theories before getting to the table) \$21.95, Haiku Poetry Generator (\$9.00), The Doctor program (\$9.00) & a Short Story Writer (\$9.00)

Our FREE CATALOG lists numerous other programs for finance, mathematics, statistics & education.

When ordering include \$2.50 for postage & handling.

Eastbench Software Products
1290 Cliffside Drive
Logan, Utah 84321
(801) 753-1084

TITAN SOFTWARE

PRESENTS

GOPHER

Can you help the Gopher move through the ever changing maze; racking up as many points as possible as you do. A superior fast action game for 1 or 2 players that fully utilizes the speed and graphics of TI's extended basic. Joysticks optional (but recommended).

SPECIAL INTRODUCTORY OFFER

- * Beat our high score in Gopher and win another game from our catalogue FREE *
- * (Photo of screen as proof) *

* * * * *

You can also test your skills with the following:

VIDEO-THELLO: The classic game of strategy derived from the ancient game of GO. For 1 or 2 players with 'Help' mode and many skill levels and options. (xbasic).

BRAINTWISTERS I: A 3 pack of games to test your powers of logic to the fullest, magic square (xbasic only), switchboard & decoder (basic or xbasic).

BRAINTWISTERS II: 2 more games to drive you crazy; Solitaire and Echo (basic or xbasic).

AND OTHERS: Write for a free brochure.

All games are available on cassette for the 4A and cost \$15.95 each (\$19.95 Canadian; Ont. residents add 7% sales tax). Add \$1.50 per order P & P. Money order, certified cheques, Visa or MasterCard (give card # exp. date), Personal cheques add 4-6 weeks. No C.O.D.'s.

TITAN SOFTWARE
1382 FORDON AVE.,
PICKERING, ONT. L1W 1J9

BEST SOFTWARE

*The Best Software at the Best Price.
All Programs By Professional Programmer.*

Special Deal:

**BUY ANY 2 PROGRAMS,
CHOOSE 1 MORE FREE!**

FROGGERY:

10 Skill Levels. Jump Your Frog Home Before Time Runs Out. Great Graphics and Sound. \$10.

BLADE RUNNER 2020:

Police the Skies. Shoot Only the Red Robot Ships. Watch Out For Evil Star Raiders. \$15.

ROBOTRON:

A Robot Chase Game That Will Put You Into A Frenzy and Drive You Beserk. \$15.

FREEWAYS:

Can Your Chicken Cross the Freeway at 5 PM? 5 Freeways. \$10.

STAR TREK 2:

Advanced Graphics and Sound Improve on This Old Classic. \$5.

**All programs are in Extended Basic
for the TI99/4A. Joystick required.**

All programs on cassette.

Send Check or Money Order to:

BEST SOFTWARE

P.O. Box 22446
Baltimore, MD 21203

**The Doryt Connection:
Because you shouldn't
have to pay for something
you don't need.**

**Paraprint 18A can save users
up to \$300.**

Our Paraprint 18A interfaces between the TI-99 and any parallel printer, eliminating the need for the TI Peripheral Expansion Box and the RS-232 Interface Card. It plugs directly into the TI-99, is fully compatible and provides daisy chain connection for TI peripherals. And our price is only \$105, so you save up to \$300 in the bargain!

Doryt also provides savings on additional 32K memory. Ours costs only \$175 and you don't have to buy the Peripheral Expansion Box. Plus it plugs directly into the TI-99, is fully compatible with all TI software and provides daisy chain connection for peripheral units.

As a further service, Doryt can provide an economical printer for the system.

Buy the Doryt 18A, 32K memory, printer, and our interconnecting cable before July 4th, and save an additional \$50 on the total package! Call collect (516) 676-7950.

**Doryt
Systems, Inc.**

14 Glen Street
Glen Cove, N.Y. 11542
(516) 676-7950.

Dealer inquiries invited.



PLATO LIVES. In TI's Home Computer.

If you want to see your kids do better in school, it's time they met PLATO™ from Texas Instruments. PLATO Basic Skills and High School Skills courseware is the most extensive computer teaching system ever developed for kindergarten through 12th grade. Until now, it was only used in schools to give children a special edge—but now they can use it at home—exclusively on the Texas Instruments 99/4A Home Computer.

The PLATO system, developed by Control Data, uses proven methods and techniques that make learning so interesting you may have a hard time getting the kids away from the computer. And they'll be learning at their own pace, from a machine that never criticizes; that builds on their newly acquired knowledge; that rewards them with a real sense of accomplishment.

PLATO Basic Skills and High School Skills courseware offers all the subjects a child needs. It teaches math, reading, social studies, grammar, science—more than 108 essential courses that build the foundation of a solid education.

Take PLATO home. And introduce your kids to the knowledge that lives in the Texas Instruments 99/4A Home Computer.

For more information, please call toll free (800) 858-4565.

Creating useful products
and services for you.



TEXAS INSTRUMENTS

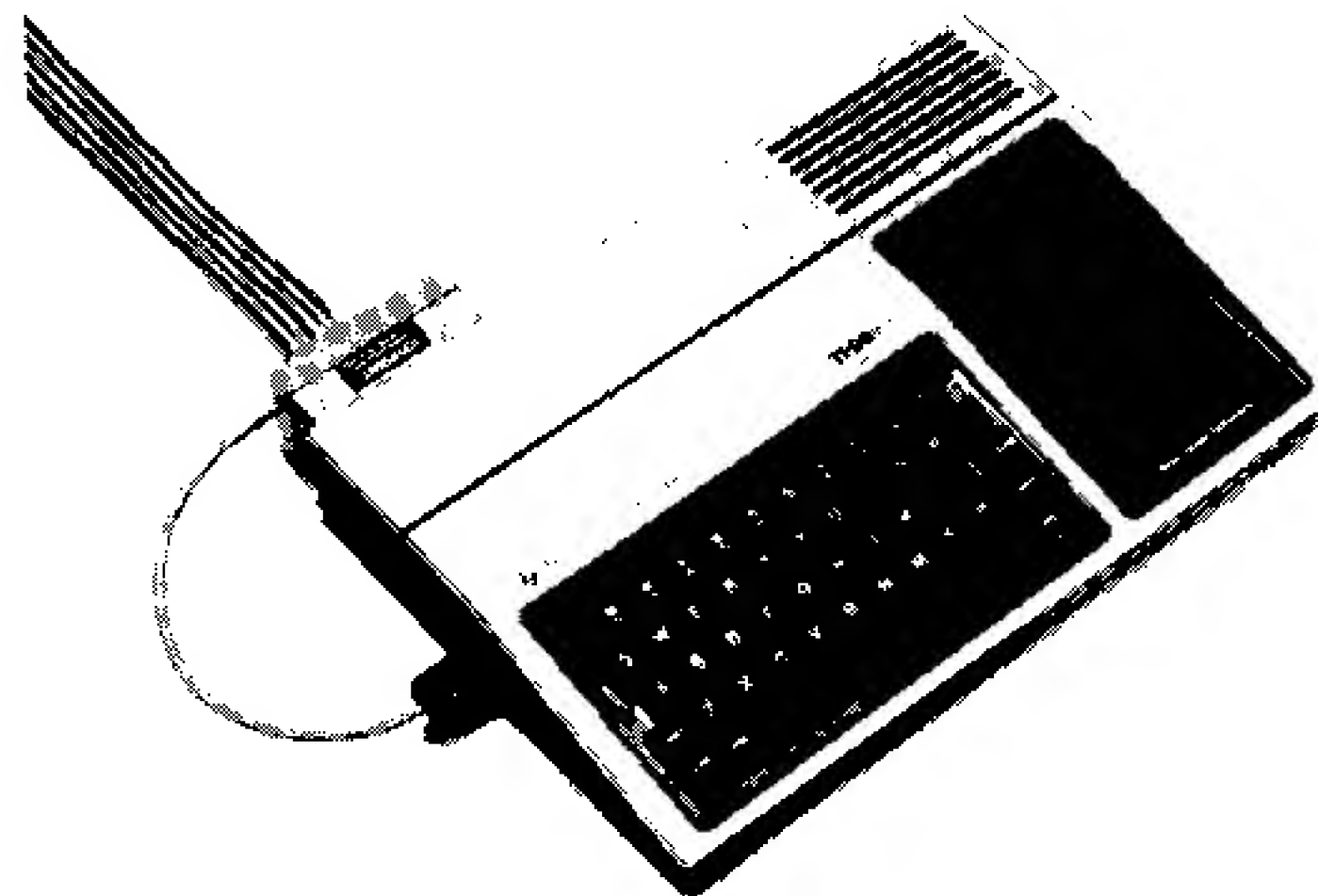
Copyright © 1983 Texas Instruments

PLATO is a trademark of Control Data Corporation, U.S.A. Copyright © 1982 Control Data Corporation. All rights reserved. PLATO courseware is manufactured under license to Texas Instruments Incorporated.





NEW — RESERVE YOURS NOW!
JOYPRINT™ — LOW COST RS232 INTERFACE
MINIPRINT™ — SOFTWARE — PRINTS
CATALOGS, FILES OR PROGRAMS



JOYPRINT™
For use with Mini Memory* and
Miniprint™

- Low cost RS232 Interface
- Attaches to TI-99/4A Joystick Port
- Connects to any serial printer
- Selectable Baud Rate from 110-19,200 Baud
- Selectable Stop Bits, Parity and Data (7 or 8 bits)

MINIPRINT™
Software

- Loads from cassette into the Mini Memory*
- Executes in the Mini Memory*
- Prints programs, files or diskette catalogs, etc.
- Print can be directed to printer connected to JOYPRINT™ or printer connected to Peripheral Box.

ORDER NOW — FREIGHT PREPAID

Quantity	Item	Price Each	Total
	JOYPRINT™	\$59.95	
	MINIPRINT™	\$19.95	
	Mini Memory*	\$99.95	
	300 CPS Thermal Printer	\$199.95	
		6% Tax for Calif. Residents	
		Total Enclosed	

☐ Check ☐ Money Order ☐ Visa ☐ MasterCard

☐ Card No. _____ Exp. _____

Name _____

Address _____

City _____ State _____ Zip _____

*Texas Instruments product

Distributor and Dealer Inquiries Invited
MODEL MASTERS • 2512B E. Fender Ave. • Fullerton, CA 92631

Blackbeard's Treasure



DIVING FOR DOUBLOONS

A Review of Blackbeard's Treasure
By Steve Schwartz

Author:	Craig Miller
Program Type:	Arcade "Treasure Diving" Game
Language:	Extended BASIC
Distributor:	Millers Graphics 1425 W. Cypress Ave. San Dimas, CA 91773
Price:	\$14.95 cassette, \$17.95 disk
System Requirements:	Extended BASIC Cartridge
	Poor Fair Good Excellent
Performance:	██████████
Engagement:	██████████
Documentation:	██████████

If you like the "chicken crossing the road" and "frog crossing the river" games, you're gonna love this new game from Millers Graphics!

Everything about this Extended BASIC program is professional—from the opening music and graphics display to the game itself. Even the instructions are unique. While they are running, you have the opportunity to practice moving the diver (with the arrow keys or joystick) before he is submerged into shark-infested waters.

When the program does begin, you take the role of a diver sitting in a boat near the top of the screen. Below you are four menacing sharks swimming in different directions and at different speeds across the screen. At the bottom of the screen is the ocean floor, where two ugly octopuses creep along. The various treasures are strewn about the ocean floor. Your job is to retrieve them—one, two, or three at a time—and bring them to your boat. You must dodge the sharks going down, elude the octopuses while picking up the treasures, and avoid the sharks once again on your way up to the surface. Because the sharks and octopuses are moving slowly in the beginning, you should have no serious trouble accomplishing your mission. Once you gather 10 treasures, your job does become harder. You guessed it—more sharks and greater speeds. With each 10 treasures you retrieve, you progress to a more difficult level—until the water is literally swarming with sharks! The author has added some realistic touches. You'll rise to the surface at a slower rate of speed depending on how many treasures you're carrying, so don't be too greedy! Also if you get eaten by a shark on the way up,

GAMEWARE BUFFET

By B. J. Bruns

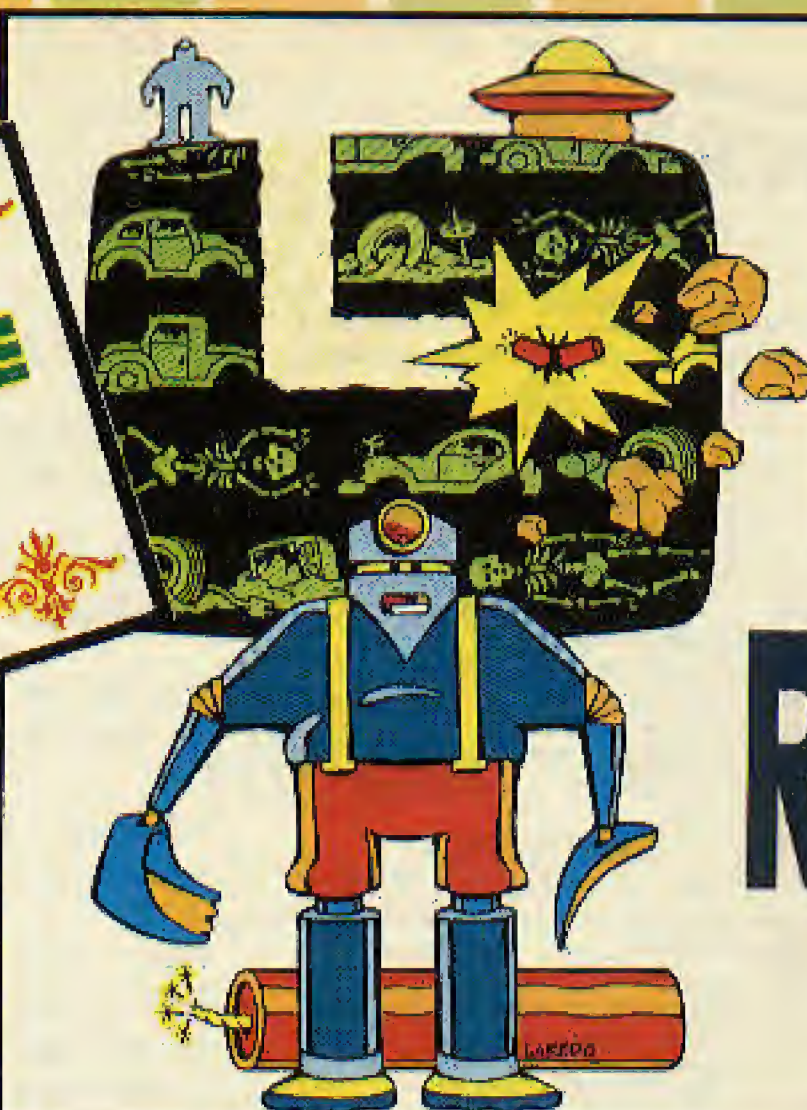
1412 B. Friendship Lane
Rantoul, IL 61866

The year is 9900 A.D. For nearly 8000 years, human beings have been roaming and conquering the galaxies. Many civilizations have risen and fallen over the millennia; among them, those of the planet Earth. The interplanetary records were destroyed 6800 years ago by a super nova, and now no one in the galaxy can say where human beings had their beginnings. Consequently, there is a massive archaeological effort under way to locate the lost planet where mankind originated. You are in charge of a robot ship sent to seek out and recover the ruins of those ancient, 20th century civilizations. Your motivation goes beyond mere intellectual curiosity. Enormous rewards are being offered for any evidence that may lead to the discovery of Earth.

Your robot ship lands on a lush, green planet that fits the descriptions passed down by the storytellers. This may actually be the ancient planet Earth! But you must find sufficient evidence to back up your hypothesis. You have three robots to do the dirty work. Before landing, the ship blasts a hole 20 feet deep into the soil to take samples. Your first robot will descend into that hole and continue the search, detonating charges and collecting ancient relics—1952 Chevrolet bodies, old bowling trophies—as it tunnels beneath the earth's surface. The others wait patiently, ready to take over should the tunnel cave in and crush their comrade.

The Game

You can control the robot through either the joystick or the keyboard. With the joystick, use the fire button to detonate the blaster. On the keyboard, use the arrow keys to maneuver your robot and the Y-key to fire the blasters. The blaster will clear 5 squares of earth. Each robot can



LOST RUINS

BASIC

carry a maximum charge of ten blasts. The blaster will detonate in whichever direction the robot is pointed. If you are working too close to the edge of the screen, the blaster may not detonate. (Perhaps as a safeguard to keep you from blasting out the side of your monitor or TV-set?)

You must take extreme care in using the explosives or you will face the possibility of a cave-in. Extensive blasting will result in more frequent cave-ins. The robot can move freely through the tunnels already excavated, or through areas where artifacts are buried. The blaster is the only means of excavating anywhere else. To pick up an artifact, you merely make contact with it. But to get points for it, you must carry it up to the surface. If you use up all your blasters, you can return to the ship for more.

Once your supply of blaster charges reaches zero, you have only a short time

to reach the surface or the robot's circuits will overheat and melt! If your robot is trapped by a cave-in after expending the last blaster charge, there is nothing it can do but wait until its battery dies. If you still have a back-up robot, you can recover any artifacts the dead robot was carrying by simply entering that area.

There are three types of artifacts. The most valuable are skeletal remains. (These are the best way to identify the planet's inhabitants.) The next-best artifacts are technological remains which are designated by shapes resembling cars. Even the third type—miscellaneous garbage piles—are useful in proving the identity of this planet's inhabitants.

After successfully retrieving all of the artifacts from the screen, your robots will move on to explore a new area of the planet—while you ponder the strange remnants of this bygone civilization.

99'er

EXPLANATION OF THE PROGRAM *Lost Ruins*

Line Nos.

100-160

Header and REMs.

170-200

Clear screen, and branch to set up game.

210-460

Place excavation site and artifacts on screen.

470-850

Routines for robot's landing.

860-980

Routine to read joystick and keyboard.

990-1540

Move robot and check for artifacts.

1550-1880

Control blaster explosion.

1890-2070

Check for distribution of artifacts.

2080-2180

2190-2380

2390-2560

2570-2630

2640-2710

2720-3290

3300-3360

3370-3450

3460-3840

3850-3900

3910-3980

3990-4020

Cave-ins.

Robot killed in cave-in.

Calculate robot's charges. Routine to display strings anywhere on screen.

Replay option. End of game.

Routine for zero charge on robot. Time delay to get out.

Print title screen.

Print introduction.

Set character patterns and colors.

Scroll up robot's ships.

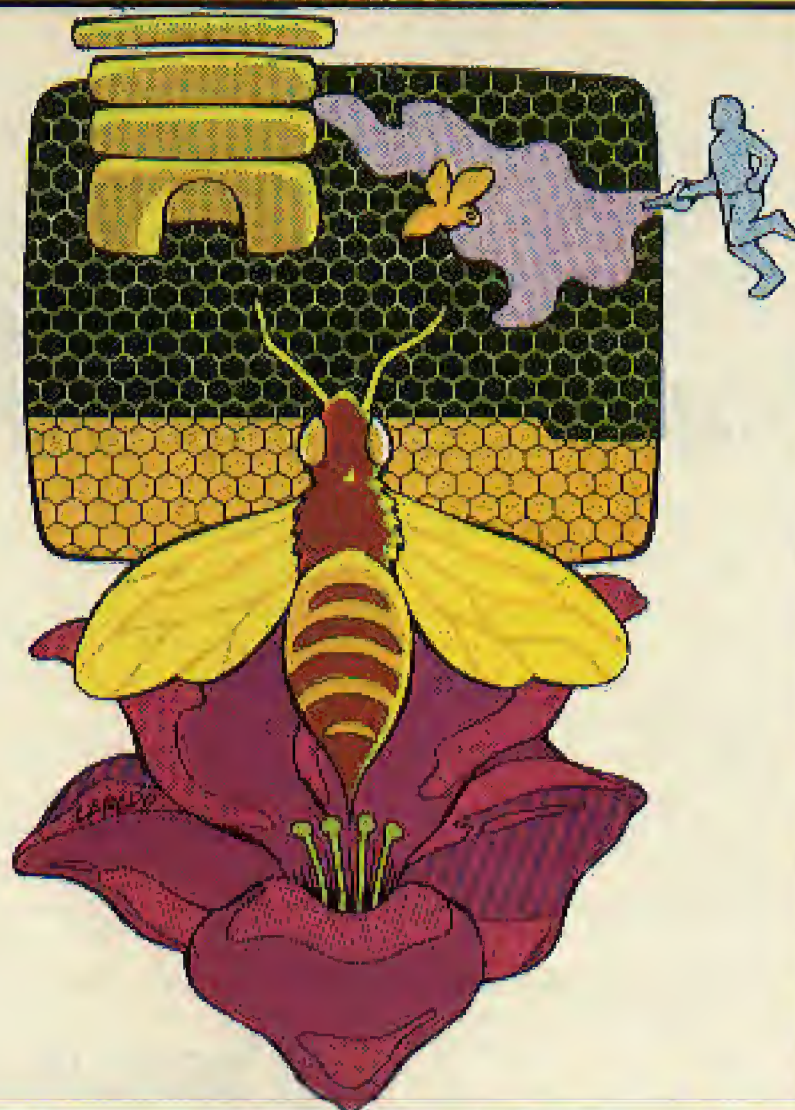
Initialize variables.

Print playing screen text.

Continued on p. 27

BEE- LINE

EXTENDED
BASIC



By David W. F. Welcker

261 South Street
W. Bridgewater, MA 02379

You are a dedicated worker bee trying to fill ten honeycombs before the onslaught of winter. Your foes are formidable—a beekeeper who is trying to smoke you out, and the constant threat of flight fatigue. To find pollen-rich flowers, you must follow the signals of your fellow drones. The louder the buzzing, the closer you are. Finally, you locate the flower patch. You dive and swerve—chasing the flowers as they reveal themselves in short flashes. Your wings feel heavy as you head back to the hive, loaded down with pollen. You must fly efficiently—your strength is waning. Hooray, you made it back to the hive! Now enter and unload the pollen. Oops! Smoked out by the beekeeper. After him! HA! YOU GOT HIM! Now to the blue hive to steal some more pollen. Hmmm this is too easy to be true. . . . Uh-oh—smoke! Rats! You got caught and lost your pollen. If you can sting the beekeeper's thumb, you will preserve the pollen supply. Got him! Now back to finish this level.

And then on to the next level, fighting greater fatigue and constant peril. As proven before in these pages, the life of an insect is not easy. Doesn't that maniacal beekeeper do anything all day but steal pollen?

Performance in this game is measured by the number of levels completed. Points, which indicate the strength of the bee, are awarded for depositing pollen in the home hive, stinging the beekeeper, and filling a level of the hive. The game ends when

your store of points (strength) is depleted to zero, or when level ten is filled with pollen. If you are caught in smoke inside the hive, you must sting the beekeeper's thumb or risk losing rows of pollen according to the level of play. Note that a level is completed by filling the hive with pollen (every other row) and then leaving it safely.

Programming Notes:

In the first version of this program, the honeycomb filled the screen and the bee filled each cell of the comb. Though that was pleasing graphically, the present version permits quicker operation and play on more than one level. Note that the level variable G is used liberally throughout the program to increase difficulty—more frequent smoke-outs with less predictable direction of smoke, quicker magic flowers, faster beekeeper response and greater penalties and rewards.

A few features were sacrificed in this program because they would have slowed down the action or made it less realistic. For instance, attempts to make the beekeeper move evasively (through use of a CALL MOTION statement) would have required the use of a separate routine. This would not permit checking for immediate hive re-entry without a great loss of speed and missed beekeeper hits.

Beeline was written for joysticks, but to accommodate those without them, performance was compromised a bit to make them optional. A pause feature is essential to this type of game and is activated by pressing P while inside either the hive. A quiet buzzing signals activation of the pause . . . the calm before the swarm!

EXPLANATION OF THE PROGRAM *Beeline*

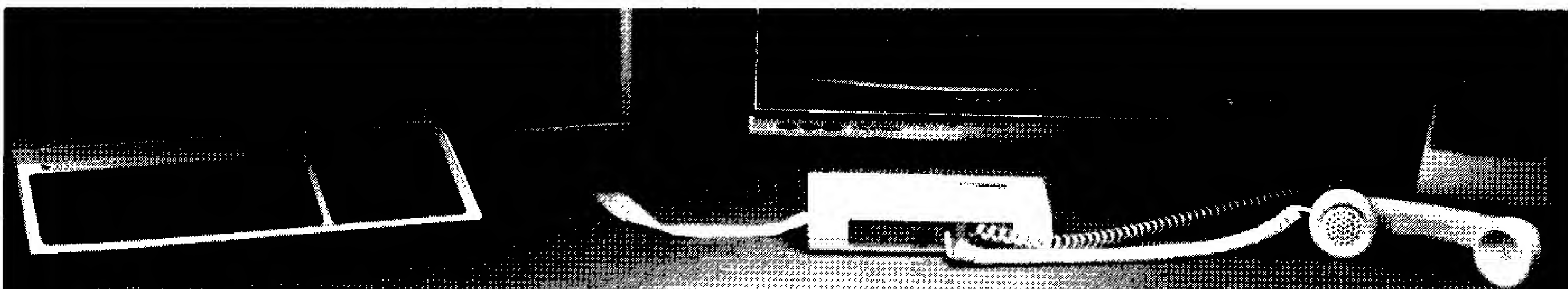
Line Nos.	
100-150	REMs, and header.
160-410	Initialize variables. Display title screen.
420-470	Input options.
480-650	Control bee's hunt for pollen.
660-770	Control bee in the hive.
780-800	Start of the game.
810-900	Control smoke and beekeeper.
910-930	Display collected pollen.
940-1020	Display outcome of game.
1030-1050	Read keyboard, and joystick.
1060-1290	Display instructions.
1300	Subroutine to scan the keyboard.

```

100 REM *****
110 REM *   BEELINE   *
120 REM *****
130 REM BY DAVID WELCKER
140 REM 99'ER VERSION 2.7.1XB
150 REM
160 RANDOMIZE
170 CALL CLEAR
180 DISPLAY AT(2,12):"BEELINE"
190 CALL SCREEN(11)
200 M$=RPT$(CHR$(124),28)
210 OPTION BASE 1
220 DIM V$(2),D$(2,18)
230 V$(2)=RPT$(CHR$(117)&CHR$(116),7):V$(1)=RPT$(CHR$(117)&CHR$(118),7)
240 CALL CHAR(96,"0000102B10000000",".97",".98",".99","")!REM OPEN FIELD BEE
250 CALL CHAR(104,"01010101003043B3",105,"0303030303030300",106,"00C0C0C00030E4E0",107,"E0E06060206030")
260 CALL CHAR(108,"0103030301302303",109,"0707030302030306",110,"00C0C0C00030E2E0",111,"E0E06060606000")
270 CALL CHAR(112,"000000000000B100B")!REM FLOWER BEE
280 CALL CHAR(116,"F00004020102040B",117,"01020408F00B0402",118,"F0F0F0FEFFFEFCFB",119,"0103070FF0F0703")
290 CALL COLOR(11,2,11)
300 FOR L=4 TO 20:DISPLAY AT(L,1):V$(1-(L/2=INT(L/2)))&V$(2+(L/2=INT(L/2))):NEXT L
310 CALL CHAR(114,"442B3B3B2B3B2B10")!REM HIVE BEE
320 CALL CHAR(120,"FF00FFFF00FFFE7")!REM HIVE
330 CALL CHAR(124,"CC3CC3CC3CC33")!REM SMOKE
340 CALL CHAR(126,"3FA905050505493F",127,"FC92A1A1A1A192FC")!REM THUMB
350 CALL CHAR(129,"00FFFF00FFFF76")!REM MYSTERY FLOWER
360 CALL CHAR(130,"183C7EFF7E3C1800")!REM POLLEN
370 CALL CHAR(134,"FF00FFFF00FFFE7")!REM BLUE HIVE
380 DISPLAY AT(23,5):"INSTRUCTIONS? (Y/N)"
390 CALL MAGNIFY(2)::CALL SPRITE(0,114,2,210,210,-4,-4)
400 CALL KEY(0,K,S)::IF K=89 OR K=121 THEN 1060:IF K<>78 AND K<>110 THEN 400
410 CALL COLOR(10,11,1,13,14,1,12,16,15,13,11,1,14,5,15)
420 DISPLAY AT(6,5)ERASE ALL BEEP:"START LEVEL? (1-9)"
430 CALL KEY(0,K,S)::G=K-49:IF G>0 OR G<0 THEN 430 ELSE DISPLAY AT(6,25):STR$(G+1):G1=G+1

```

Continued on p. 26



Get Your 99/4A On Line for \$139

Now there is an inexpensive alternative to TI's acoustic modem.

The Signalman Mark III Direct Connect Modem is engineered specifically for the TI computer. It comes complete with the cables other modem manufacturers make you buy separately.

It plugs right in to the TI RS232 interface and your telephone. And it's simpler to operate.

The Signalman automatically selects the appropriate mode: originate or answer. It's so easy to use, you can be telecommunicating in a few minutes.

And Signalman modems are made by the world's largest manufacturer of modems. They're so reliable we back them with a one year limited warranty.

There's a whole new world of things your computer can do for you—1450 telecommunication services. Electronic mail. Friends to communicate with.

And now there's a more affordable way to enter that new world.

Signalman Mark III.

For a limited time, we're offering a subscription to The Source with your Signalman purchase. Ask your computer dealer.

SIGNALMAN MODEMS

from Anchor Automation

6624 Valjean Avenue

Van Nuys, California 91406

TI 99/4A is a Trademark of Texas Instruments.

The Source is a Servicemark of Source Telecomputing Corporation

Beeline

```

440 DISPLAY AT(12,5)BEEP:"JOYSTICK
S? (Y/N)"
450 CALL KEY(0,K,S):: IF K=78 OR K
=110 THEN 470
460 IF K<>89 AND K<>121 THEN 450 E
LSE JS=-1 :: DISPLAY AT(22,5):
"CHECK ALPHA LOCK" :: GOTO 480
470 JS=0
480 CALL DELSPRITE(ALL):: R=40 ::
C=125 :: Z=0 :: GOTO 780
490 FOR L=1 TO 18 :: Q$(1,L)=V$(2)
:: Q$(2,L)=V$(1):: NEXT L :: I
F G>10 THEN 990
500 CALL HCHAR(3,1,32,704):: CALL
SCREEN(4):: C9=0
510 CALL VCHAR(4,24,120):: CALL VC
HAR(4,8,136):: CALL MAGNIFY(1)
520 CALL SPRITE(#5,96,2,R,C):: IF
J>4 AND J<23 THEN 860
530 CALL DELSPRITE(#9):: F1=60+INT
(RND*130):: F2=25+INT(RND*215)
:: J=4 :: L=0
540 GOSUB 1030 :: CALL MOTION(#5,-
Y,X)
550 CALL POSITION(#5,B1,B2):: S=IN
T((ABS(F1-B1)+ABS(F2-B2))/17.2
):: CALL SOUND(-500,RND*6+110,
S)
560 IF ABS(B1-32)<6 AND((ABS(B2-18
7)<6)+(ABS(B2-60)<6))THEN 660
570 IF L>0 THEN 880 :: SC=SC-G ::
GOSUB 910 :: IF S>0 OR Z=25 TH
EN 540
580 CALL DELSPRITE(ALL)
590 CALL MAGNIFY(2):: CALL SPRITE(
#10,129,7,122+RND*62,RND*230+1
):: CALL SPRITE(#6,112,11,100,
120)
600 GOSUB 1030 :: CALL MOTION(#6,-
2*Y,2*X)
610 CALL COINC(ALL,N):: SC=SC-G-N*
G*4 :: CALL POSITION(#6,R,C)::
IF R<60 THEN 650 :: IF N THEN
640

```

```

620 GOSUB 910 :: CALL SOUND(-500,R
ND*8+110,3):: IF RND<.90-G*.01
5 THEN 600
630 CALL LOCATE(#10,90+RND*70,10+R
ND*230):: GOTO 600
640 Z=Z+1 :: CALL SOUND(-300,120+Z
,5):: IF Z<21 THEN 620
650 CALL POSITION(#6,R,C):: CALL D
ELSPRITE(ALL):: GOTO 510
660 C9=(ABS(B2-187)<6):: H=2+C9 ::
CALL DELSPRITE(ALL)
670 CALL MAGNIFY(2):: CALL SCREEN(
2):: CALL HCHAR(3,1,32,704)::
IF J>4 THEN 690
680 R=165 :: C=124
690 CALL COLOR(11,2,2):: FOR L=1 T
O 18 :: DISPLAY AT(L+4,8):Q$(H
,L):: NEXT L :: CALL COLOR(11,
11,16)
700 J=4-(RND<.1+G/25)*19 :: P=1+2*
(J=23):: CALL SCREEN(6-C9*9)::
CALL SPRITE(#7,114,2,R,C)
710 GOSUB 1030 :: CALL MOTION(#7,-
Y,X)
720 CALL POSITION(#7,R,C):: IF ABS
(99-R)>75 THEN 760 :: IF RND>.
99-G*.01 OR(J>4)*(J<23)THEN 80
0
730 CALL KEY(2,K,S):: IF K=18 THEN
740 ELSE IF K=11 THEN 1300 EL
SE 710
740 R=INT(R/8-2+(R>167)):: IF Q$(H
,R)=V$(H)OR C9*(Z<7)OR H*Z=42
THEN 710
750 Q$(H,R)=V$(H):: DISPLAY AT(R+4
,8):Q$(H,R):: Z=Z+7+C9*14 :: S
C=SC-7*G*C9 :: GOSUB 910 :: GO
TO 710
760 CALL DELSPRITE(ALL):: R=40 ::
C=56-C9*128 :: L=0
770 L=L+1 :: IF C9=0 OR Q$(H,L)=V$
(2)THEN 500 :: IF L<>18 THEN 7
70
780 G=G+1 :: DISPLAY AT(1,4)SIZE(9
):"LEVEL: "&STR$(G):: CALL SOU
ND(200,660,4)

```

```

790 CALL SOUND(400,990,2):: SC=SC+
G*150 :: GOSUB 910 :: GOTO 490
800 J=J+P :: DISPLAY AT(J,1):M$
810 IF SGN(J-INT(1.5+R/8))<>SGN(P)
THEN 710 ELSE CALL MOTION(#7,0
,0):: CALL HCHAR(5,1,124,576):
: L,Z=0
820 GOSUB 910 :: U=41+RND*8*(16-G)
:: R1=RND>.5 :: CALL SPRITE(#1
8,126-R1,10,U,235+R1*225):: U=
INT(1+U/8)
830 GOSUB 1030 :: CALL MOTION(#7,-
2*Y,2*X):: CALL COINC(ALL,N)::
L=L+1 :: IF N THEN 850 ELSE I
F L<50-G*2 THEN 830
840 FOR L=U TO U+G-1 :: Q$(H,L-4)=
V$(2):: NEXT L :: CALL POSITIO
N(#7,R,C):: GOTO 660
850 CALL SOUND(200,115,3):: SC=SC+
5*G :: GOSUB 910 :: CALL POSIT
ION(#7,R,C):: GOTO 660
860 CALL MAGNIFY(3)
870 CALL SPRITE(#9,108,7,24+G,C+SG
N(90-C)*15,2-INT(RND*3+1)*(RND
<G/10),SGN(90-C)*3):: J=4 :: L
=0
880 CALL COINC(ALL,N)
890 IF N THEN 900 :: L=L+3 :: CALL
PATTERN(#9,104-4*(INT(L/2)=L/
2)):: IF L<100-G*2 THEN 540 EL
SE 530
900 CALL SOUND(300,990,3):: SC=SC+
20*G :: GOTO 530
910 DISPLAY AT(1,22):SC :: IF Z=0
THEN 920 :: DISPLAY AT(2,4):RP
T$(CHR$(130),Z):: GOTO 930
920 CALL HCHAR(2,5,32,28)
930 IF SC<=0 THEN 940 :: RETURN
940 CALL DELSPRITE(ALL):: CALL CLE
AR
950 CALL SOUND(500,140,2):: CALL S
OUND(1000,110,3):: DISPLAY AT(
10,6):"LEVELS COMPLETED: "&STR
$(G-61)
960 DISPLAY AT(4,5):"OOPS - BEE EX
HAUSTED!"

```



```

970 DISPLAY AT(15,5):"REPLAY? PRE
SS REDD" :: DISPLAY AT(17,5):"
TO END PRESS CLEAR"
980 CALL KEY(0,K,S):: IF K=6 THEN
420 ELSE 980
990 CALL DELSPRITE(ALL):: CALL CLE
AR :: CALL SOUND(300,466,2)::
CALL SOUND(300,587,2):: CALL S
OUND(800,784,1)
1000 DISPLAY AT(13,1):"YOU HAVE EARN
ED YOUR WINGS"
1010 DISPLAY AT(16,7):"AND A LONG R
EST!" :: DISPLAY AT(20,7):"SCOR
E: "&STR$(SC)
1020 DISPLAY AT(23,6):"LEVELS COMPL
ETED: "&STR$(G-G1):: STOP
1030 IF NOT JS THEN 1040 ELSE CALL
JOYST(2,X,Y):: RETURN
1040 CALL KEY(1,K,S)
1050 X=4*((K=4)+(K=2)+(K=15)-(K=6)-
(K=3)-(K=14)):: Y=4*((K=15)+(K
+1=1)+(K=14)+(K>3)*(K<7)):: RE
TURN
1060 DISPLAY AT(4,1):"USE THE ARROW
KEYS AND THE"
1070 DISPLAY AT(5,1):"W,R,Z AND C K
EYS TO FLY THE" :: DISPLAY AT(
6,1):"BEE. TO COLLECT POLLEN"
1080 DISPLAY AT(7,1):"FOLLOW THE BU
ZZING UNTIL IT" :: DISPLAY AT(
8,1):"GETS LOUDEST - THEN TOUC
H"
1090 DISPLAY AT(9,1):"THE MAGIC FLO
WER. YOU MAY": "ALSO STEAL POLL
EN BY ENTER-"
1100 DISPLAY AT(11,1):"ING THE BLUE
HIVE AND PRESS-": "ING FIRE (Y
) TO PICK IT UP."
1110 DISPLAY AT(13,1):""
1120 DISPLAY AT(14,1):" POLLEN IS
PUT INTO THE": "WHITE HIVE THE
SAME WAY. THE"
1130 DISPLAY AT(16,1):"GOAL IS TO F
ILL ALL TEN HIVE": "LEVELS BEFO
RE EXHAUSTING THE"
1140 DISPLAY AT(18,1):"BEE. YOU MUS
T WATCH FOR THE": "BEEKEEPER AS
HE WILL PUFF"
1150 DISPLAY AT(20,1):"SMOKE THROUG
H THE HIVE AND": "TRY TO TAKE T
HE POLLEN OUT."
1160 DISPLAY AT(23,5):"PRESS ANY KE
Y"
1170 CALL KEY(0,K,S):: IF S=0 THEN
1170
1180 CALL CLEAR :: DISPLAY AT(2,1):
"WHEN YOU SEE THE SMOKE, GET":
"OUT THE HIVE'S TOP OR BOTTOM"
1190 DISPLAY AT(4,1):"AND STING THE
BEEKEEPER FOR": "BONUS POINTS.
IF YOU ARE"
1200 DISPLAY AT(6,1):"CAUGHT IN THE
SMOKE YOU LOSE": "ANY POLLEN Y
OU HAVE AND MUST"
1210 DISPLAY AT(8,1):"TRY TO BITE T
HE BEEKEEPER'S": "THUMB OR RISK
LOSING POLLEN": "FROM THE HIVE
."
1220 DISPLAY AT(11,4):"THE OBJECT I
S TO FILL THE": "TEN LEVELS OF
THE HIVE WITH-"
1230 DISPLAY AT(13,1):"OUT EXHAUSTI
NG THE BEE.": "A ZERO SCORE EXH
AUSTS THE ": "BEE."
1240 DISPLAY AT(17,1):"THE BEE IS M
ORE EASILY TIRED": "AND INVIGOR
ATED AT HIGHER ": "LEVELS."
1250 DISPLAY AT(20,1):"ENTER HIVES
AT THEIR BOTTOM."
1260 DISPLAY AT(21,1):"THE BEE HOLD
S 3 POLLEN ROWS.": "PRESS P IN
HIVE TO PAUSE."
1270 DISPLAY AT(24,9):"PRESS ANY. KE
Y "
1280 CALL KEY(0,K,S):: IF S=0 THEN
1280
1290 GOTO 410
1300 CALL KEY(2,K,S):: CALL SOUND(-
99,INT(RND*8+110),10):: IF B<>
1 THEN 1300 ELSE 710
100 REM *****
110 REM * LOST RUINS *
120 REM *****
130 REM BY B J BRUNS
140 REM 99'ER VERSION 2.7.1
150 REM
160 REM
170 RANDOMIZE
180 CALL SCREEN(8)
190 CALL CLEAR
200 GOTO 3300
210 REM DRAW SCREEN
220 CALL HCHAR(3,1,125,32)
230 CALL HCHAR(3,14,120,5)
240 CALL HCHAR(4,1,120,32)
250 CALL HCHAR(22,1,125,32)
260 CALL VCHAR(5,1,125,17)
270 CALL VCHAR(5,32,125,17)
280 SNUG=0
290 FOR R2=5 TO 21
300 FOR C2=2 TO 30 STEP 2
310 T=INT(RND*3)+1
320 ON T GOTO 440,440,330
330 ON INT(RND*10)+1 GOTO 340,340,
340,340,340,370,370,370,400,40
0
340 CALL HCHAR(R2,C2,116)
350 CALL HCHAR(R2,C2+1,117)
360 GOTO 420
370 CALL HCHAR(R2,C2,112)
380 CALL HCHAR(R2,C2+1,113)
390 GOTO 420
400 CALL HCHAR(R2,C2,114)
410 CALL HCHAR(R2,C2+1,115)
420 SNUG=SNUG+2
430 GOTO 450
440 CALL HCHAR(R2,C2,120,2)
450 NEXT C2
460 NEXT R2
470 R1=1
480 C1=19
490 A$=SH1$
500 GOSUB 2570
510 R1=2
520 A$=SH2$
530 GOSUB 2570
540 FOR LD=1 TO 4
550 CALL SOUND(-4000,220*LD,30/(LD
^2*2))
560 CALL HCHAR(2,21,135+LD)
570 CALL HCHAR(2,22,139+LD)
580 FOR TD=1 TO 50
590 NEXT TD
600 NEXT LD
610 CALL SOUND(3000,110,0,220,0,44
0,0,-3,0)
620 ON MINER GOTO 650,640,630
630 CALL VCHAR(1,8,107,2)
640 CALL VCHAR(1,10,107,2)
650 CALL VCHAR(1,16,107,4)
660 CALL SOUND(300,500,0,-6,0)
670 ON MINER GOTO 700,690,680
680 CALL VCHAR(1,8,32,2)
690 CALL VCHAR(1,10,32,2)
700 CALL VCHAR(1,16,32,4)
710 CALL HCHAR(2,1,32,19)
720 ON MINER GOTO 750,740,730
730 CALL HCHAR(2,8,64)
740 CALL HCHAR(2,10,64)
750 CALL HCHAR(2,16,64)
760 C=16
770 REM ERASE DEAD MINER
780 ON MINER GOTO 840,810,790
790 CALL HCHAR(2,16,64)
800 GOTO 860
810 CALL HCHAR(2,8,32)
820 CALL HCHAR(2,16,64)
830 GOTO 860
840 CALL HCHAR(2,10,32)
850 CALL HCHAR(2,16,64)
860 REM KEY/JOYSTICK INPUT
870 CALL KEY(1,KEY,ST)
880 IF ST=0 THEN 940
890 IF KEY=11 THEN 1550
900 IF KEY>5 THEN 860
910 IF KEY<1 THEN 920 ELSE 930
920 KEY=0
930 ON KEY+1 GOTO 1160,860,1080,12
40,860,1000
940 CALL KEY(2,KEY,ST)
950 IF KEY=18 THEN 1550

```

UNISOURCE

YOUR ONE SOURCE FOR 3RD PARTY SOFTWARE, PERIPHERALS AND ACCESSORIES

SOFTWARE—Hundreds of pro-
grams by many authors including:

American	North Hills
Chaffin	Norton
Data Systems	Not-Polyoptics
Extended	Oak Tree
Futura	Pewterware
Fantasy	Patio Pacific
Galactic	Program Design
Hall	Prof. Microware
Linear	P S
Micro-Ed	Pewterware
Microcomputer	Simulsoft
Morreale	and more!
Moonbeam	

PERIPHERALS & ACCESSORIES

—From 10MB Hard Disk Drives to
dust covers . . . everything you might
need for your TI Home Computer.

SAVINGS—Ask about our discount
program that applies to everything
we sell—no minimum order.

ORDER TODAY. We Ship Tomor-
row* or We Pay the Freight on any
items currently in production. *Next
business day; Continental U.S. only.

For more information or to order,
call us on our toll free hotline:

1-800-858-4580

(in Texas call 1-806-745-8834)

or write us at

P.O. Box 64240,
Lubbock, TX 79464.

UNISOURCE ELECTRONICS, INC.

Continued on p. 29

YOU CAN'T CALL IT A GOOD DEAL UNTIL YOU'VE SEEN THEIR LAST CARD ...

Fact is, not all of the so-called "RS232 interfaces" on the market conform to the EIA RS232C specification. This means that you could get stuck with one that won't work with your printer, modem or other peripheral.

Worse yet, interfaces that require the Mini-Memory module are not directly compatible with TI Basic, Extended Basic, LOGO and other existing software. This means that you won't be able to LIST your programs directly to your printer!

The good news is that there is a product that you can trust. A J International's RS232 interface is *guaranteed* to be compatible with all existing software and hardware. In fact, we have designed in special features such as a "switch selectable device address" and "soft-coded" VDP offsets so that our product will be compatible with all future hardware, software and programming languages.

What's more, our interface supports more software functions as well more RS232 hardware signals than Texas Instrument's own RS232 card. And since ours is "stand-alone," you don't have to buy a Peripheral Expansion System or HEXBUS™ interface to use it!



Enclose Check/Money Order or provide credit card information.

- | | |
|---|----------|
| <input type="checkbox"/> RS232 Interface (User's Manual Included) | \$169.95 |
| <input type="checkbox"/> User's Manual Only | \$ 14.95 |

Name _____

Address _____

City _____ State _____ Zip _____

☐ Payment enclosed ☐ VISA ☐ MASTERCARD

Card # _____

Expiration Date _____

Signature _____

Sorry — No COD. PA Add 6% Sales Tax. Add 5% Shipping Outside U.S.

A J International

4023 Sommers Avenue Drexel Hill, PA 19026
(215) 623-8083

HEXBUS™ is a Registered Trademark of Texas Instruments, Inc.

© 1983 A J International

YOU'D BE AMAZED.

If you own a TI 99/4A, you're already geared for a business of your own. A business with virtually untapped potential... a business that will profit in direct proportion to the home and business computer boom... a business that will give you the freedom of working and succeeding on your own terms.

Scotch Marketing is the multi-level marketing plan for computer software and related products. Already, Scotch Marketing dealers in all 50 states are building businesses of their own with the help of a comprehensive marketing tool we call SSS - Scotch Success System.

All it takes to profitably make it on your own is the hardware you may already own... and the SSS Plan.

Scotch
MARKETING

AMAZE ME!!

Send me the information on
Tomorrow's Opportunity Today...
The SSS Plan and You.
P.O. Box 1636 SSS Springfield, MO 65805

Name: _____

Address: _____

City: _____

State: _____ Zip: _____

Phone: () _____

Lost Ruins . . . from p. 27

```

960 CALL JOYST(2,X,Y)
970 KEY=((X+3*Y)/4)+5
980 ON KEY GOTO 860,1160,860,1080,
    860,1240,860,1000,860
990 REM MOVE SEQUENCE
1000 IF R-1<2 THEN 860
1010 PO=1
1020 CALL GCHAR(R-1,C,CH)
1030 IF (CH=32)+(CH=132)+((CH>111)*
    (CH<118))+(CH=91) THEN 1040 ELS
    E 860
1040 IF CH=132 THEN 2400
1050 CALL HCHAR(R,C,32)
1060 R=R-1
1070 GOTO 1310
1080 IF C-1<1 THEN 860
1090 PO=2
1100 CALL GCHAR(R,C-1,CH)
1110 IF (CH=32)+(CH=132)+((CH>111)*
    (CH<118))+(CH=91) THEN 1120 ELS
    E 860
1120 IF CH=132 THEN 2400
1130 CALL HCHAR(R,C,32)
1140 C=C-1
1150 GOTO 1310
1160 IF R+1>22 THEN 860
1170 PO=3
1180 CALL GCHAR(R+1,C,CH)

```

```

1190 IF (CH=32)+(CH=132)+((CH>111)*
    (CH<118))+(CH=91) THEN 1200 ELS
    E 860
1200 IF CH=132 THEN 2400
1210 CALL HCHAR(R,C,32)
1220 R=R+1
1230 GOTO 1310
1240 IF C+1>32 THEN 860
1250 PO=4
1260 CALL GCHAR(R,C+1,CH)
1270 IF (CH=32)+(CH=132)+((CH>111)*
    (CH<118))+(CH=91) THEN 1280 ELS
    E 860
1280 IF CH=132 THEN 2400
1290 CALL HCHAR(R,C,32)
1300 C=C+1
1310 IF CH=32 THEN 1460
1320 IF CH=91 THEN 1490
1330 SNUG=SNUG-1
1340 IF (CH<112)*(CH>113) THEN 137
    0
1350 MNUG=MNUG+3
1360 GOTO 1420
1370 IF (CH<114)*(CH>115) THEN 140
    0
1380 MNUG=MNUG+5
1390 GOTO 1420
1400 IF (CH<116)*(CH>117) THEN 142
    0

```

```

1410 MNUG=MNUG+1
1420 R1=23
1430 C1=12
1440 A%=STR$(MNUG)
1450 GOSUB 2570
1460 CALL HCHAR(R,C,64)
1470 CALL SOUND(100,-5,2)
1480 GOTO 860
1490 MNUG=MNUG+DNUG
1500 R1=23
1510 C1=12
1520 A%=STR$(MNUG)
1530 GOSUB 2570
1540 GOTO 1460
1550 REM EXPLOSIONS
1560 IF (R<2)+(R>21)+(C<2)+(C>31) TH
    EN 860
1570 ON PO GOSUB 1770,1800,1830,186
    0
1580 IF C1<2 THEN 860
1590 CALL GCHAR(R1,C1,CH1)
1600 CALL GCHAR(R1-1,C1-1,CH2)
1610 CALL GCHAR(R1+1,C1-1,CH3)
1620 CALL GCHAR(R1-1,C1+1,CH4)
1630 CALL GCHAR(R1+1,C1+1,CH5)
1640 GOSUB 1890
1650 CALL HCHAR(R1,C1,104)
1660 CALL HCHAR(R1-1,C1-1,105)
1670 CALL HCHAR(R1+1,C1-1,106)
1680 CALL HCHAR(R1-1,C1+1,106)
1690 CALL HCHAR(R1+1,C1+1,105)
1700 CALL SOUND(1000,110,15,-7,2)
1710 CALL HCHAR(R1-1,C1-1,32)
1720 CALL HCHAR(R1,C1,32)
1730 CALL HCHAR(R1+1,C1-1,32)
1740 CALL HCHAR(R1-1,C1+1,32)
1750 CALL HCHAR(R1+1,C1+1,32)
1760 GOTO 2020
1770 R1=R-1
1780 C1=C
1790 RETURN
1800 C1=C-1
1810 R1=R
1820 RETURN
1830 R1=R+1
1840 C1=C
1850 RETURN
1860 C1=C+1
1870 R1=R
1880 RETURN
1890 REM SUBTRACT NUG & LIMIT EXPL
    OSIONS TO PLAYING SCREEN
1900 IF (CH1=125)+(CH2=125)+(CH3=12
    5)+(CH4=125)+(CH5=125) THEN 860
1910 IF (CH1<112)+(CH1>117) THEN 193
    0
1920 SNUG=SNUG-1
1930 IF (CH2<112)+(CH2>117) THEN 195
    0
1940 SNUG=SNUG-1
1950 IF (CH3<112)+(CH3>117) THEN 197
    0
1960 SNUG=SNUG-1
1970 IF (CH4<112)+(CH4>117) THEN 199
    0
1980 SNUG=SNUG-1
1990 IF (CH5<112)+(CH5>117) THEN 201
    0
2000 SNUG=SNUG-1
2010 RETURN
2020 CHARGES=CHARGES-1
2030 R1=23
2040 C1=27
2050 A%=STR$(CHARGES)
2060 CALL HCHAR(23,27,32,3)
2070 GOSUB 2580
2080 REM CAVE INS
2090 FOR I=1 TO 10
2100 R1=INT(RND*17)+4
2110 C1=INT(RND*29)+2
2120 CALL GCHAR(R1,C1,CH)
2130 IF (CH>111)*(CH<118) THEN 2380
2140 IF CH=64 THEN 2180
2150 IF CH<32 THEN 2380
2160 CALL HCHAR(R1,C1,120)
2170 GOTO 2380
2180 DNUG=MNUG
2190 REM CAVE-IN ON MINER
2200 RESTORE 2330
2210 CALL HCHAR(R,C,91)
2220 MNUG=0
2230 CALL HCHAR(23,12,32,5)
2240 MINER=MINER-1

```

Continued on p. 32

This column is an ongoing tutorial. Part one appeared in the April 1983 issue of 99'er HCM. To obtain full benefits from this column, a newcomer to *Multiplan* may find it useful to read the previously printed columns.

Last month, we took a general look at Microsoft's new *Multiplan* package for the TI-99/4A and showed some examples of spreadsheets that were made using it. In this column, we'll describe in detail how *Multiplan* was used to make one of those worksheets. To give you an idea of what it's like to use *Multiplan*, we'll develop a simple checkbook balancing model that will let you balance your checkbook easily, and provide you with expense totals which can be used in a budget.

What categories of expense do we want to keep track of? Let's use these five categories: rent, food, clothing, education, and entertainment, plus a sixth category for everything else. You will probably want to track different expenses, but the principles are the same.

Getting Started

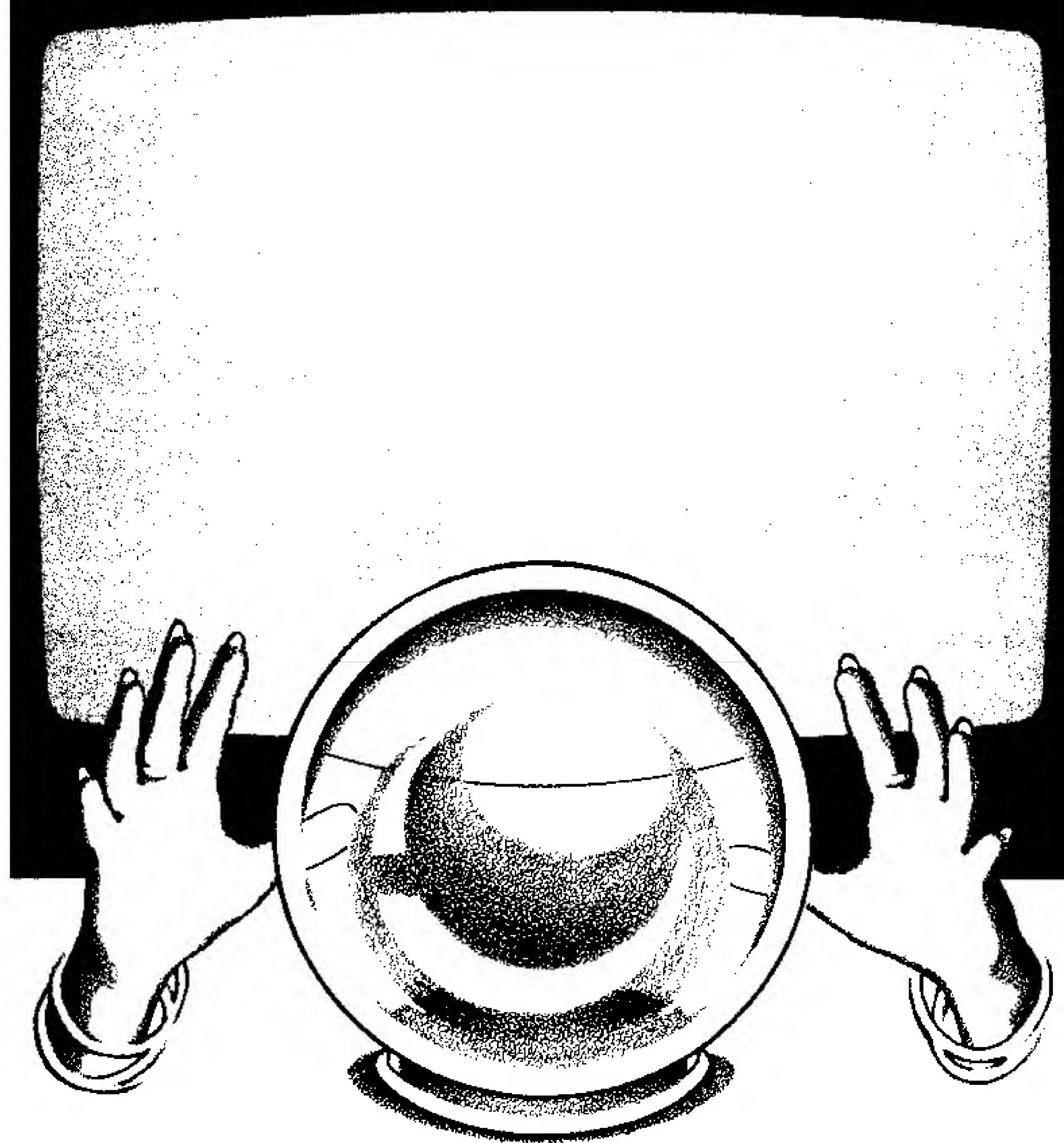
After you have activated the system, you can select a command by typing its first letter, or you can press the space bar until the command you want is highlighted and use ENTER to select it. Many of the commands have several options which automatically appear on the command line when appropriate. You use the same method to select options.

Notice that the rows of the worksheet are numbered down the left-hand side, and the columns are numbered across the top. Each intersection of a row and column is called a *cell*. Every cell is uniquely identified by its row and column number, with row number always given first. The *cell pointer* shows the position on the worksheet where information is to be entered next. You can move the cell pointer around in a number of ways. The easiest way is to use the arrow keys. To move the cell pointer one cell to the right, press FCTN and D (right arrow). You'll see that the cell at row 1, column 2 is now highlighted and the notation R1C2 appears in the lower left corner of the screen.

Let's get the cell pointer back to row 1, column 1. We can do this with the arrow keys, or we can use the special method of getting to the *home* position: holding down CTRL and 1 together. A plastic keyboard strip which comes with *Multiplan* shows the key positions of many handy functions.

Checkbook Balancer

Now we can begin constructing the model for balancing the checkbook. I usually use line 1 (row 1) for the title of the worksheet. We'll call this worksheet *Checks During January*, and put one word of the title in each of the first three cells of



row 1. The cell pointer should be at R1C1. To put the word *Checks* there, we'll use the ALPHA command. If the command line has ALPHA highlighted already (as it usually does), press ENTER; otherwise type A. The command line will change to ALPHA, now type the word *Checks*.

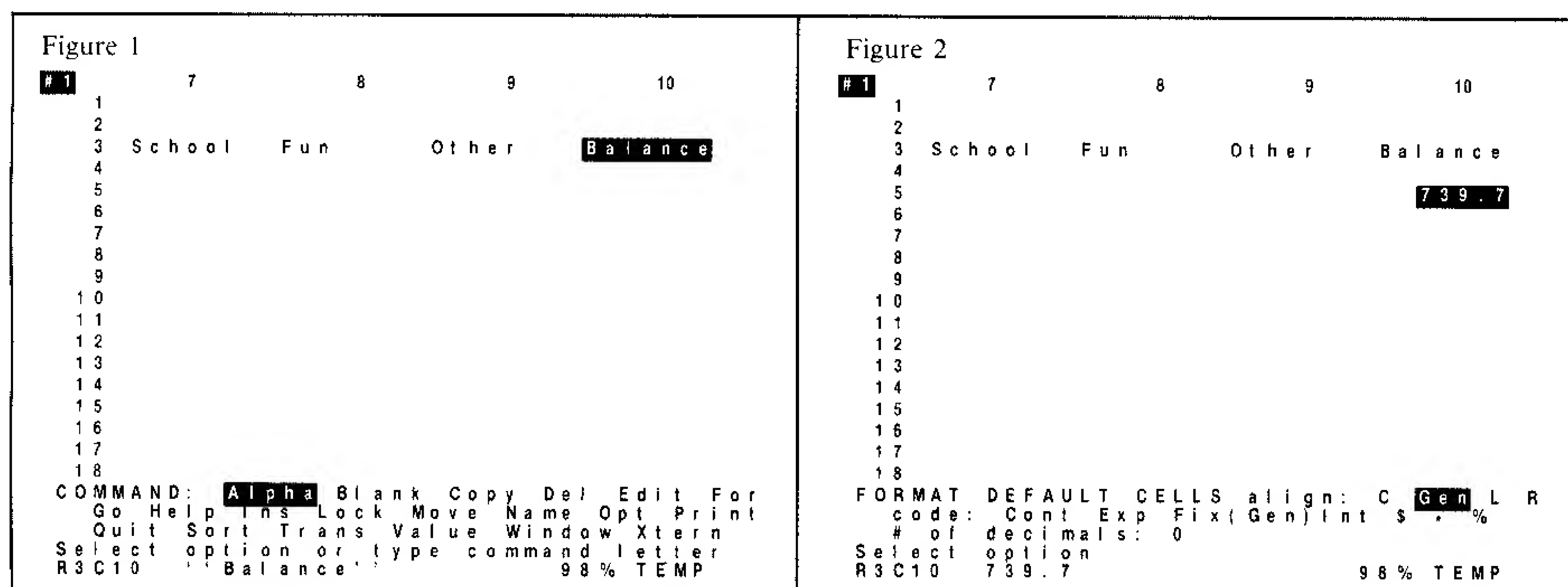
There are two ways to tell *Multiplan* to put the word in the cell: you can press ENTER, or you can use one of the arrow keys. Because you want to put the word *During* at R1C2 next, you may press the right arrow after typing *Checks*. This puts *Checks* in R1C1 and leaves the cell pointer at R1C2. The command line now says ALPHA/VALUE:, meaning that you can enter a title or a value into R1C2. If the first character entered is not a number, the entry will be ALPHA and is equivalent to a string in BASIC. If the first character entered is a number, the entry is con-

sidered to be numeric only. If your entry requires the first character to be numeric with alphabetic characters to follow, you can return to the master option menu and select ALPHA. You must take care, however, when entering values that the prompt "ALPHA/VALUE:", or "VALUE:" is present, or the value you enter will be considered a string, and computations cannot be performed on it.

Type the word *During*, but watch out! *Multiplan* is primed to accept words or numbers here and it needs a second to think things over. In practice this means that you must type the D, pause for a beat, and then type the rest of the word (as quickly as you like). You'll get used to this after a while, but the first time you may find that you have typed in *Dring* instead of *During*. If you spot this error before you press the arrow key, you can backspace (FCTN 9) and retype the word correctly. (*Multiplan* has many nice editing features; we'll get into them later). In any case, you'll want to press the right arrow key after *During* is typed, and then type the word *January* in R1C3. After typing *January*, just press ENTER. This will leave the cell pointer at R1C3.

Next, we'll put headings on the columns in a similar way. Let's start our column headings in R3C1. Move the cell pointer to R3C1 using the arrow keys. There will be 10 columns on the worksheet, headed: Check#, Paid to, Income, Rent, Food, Clothes, School, Fun, Other, and Balance. Select the command ALPHA, type Check#, press the right arrow key, type *Paid to*, press the right arrow key, and so on until you have all ten headings in successive cells of Row 3. When you are done, your screen will look like Figure 1.

Now start entering the information from the checkbook for January. Start with the checkbook balance at the beginning of January. This item has no check number, and its amount is not allocated to any expense. So put the Alpha description "FOR-



WARD" in R5C2 (under Paid to), and then arrow right until the cell pointer is in the Balance column (R5C10). To enter the balance forward, just type the amount and press ENTER. If you want all the check amounts and totals to have two decimal places (so they will automatically display 25.50, instead of 25.5), you can change the *default* (most common) format for the worksheet.

FORMAT command has two options: CELLS and WIDTH. Choose CELLS. Figure 2 shows the screen at this point. Notice that there are three characteristics of the FORMAT DEFAULT for the CELLS: alignment, code, and number of decimal places. When you first select this command, the defaults are set to General alignment, General format code, and 0 decimal places. General alignment is fine for now, so we don't want to change it. To go on to the format codes, press CTRL and 2 (called TAB on the strip). We want to change the format code from General to Fixed. Press the space bar until FIX is highlighted. Do not press ENTER yet. ENTER is the signal for *Multiplan* to execute the command (in this case, to change the default format), but our default format is not exactly right yet: We still need to change to 2 decimal places. TAB down to the number of decimal places and type 2. Look at the format now. It should have General alignment, Fixed format code, and 2 decimal places. If it doesn't, fix the section that's wrong by TABing around and selecting the correct entry. When the format looks right, press ENTER. You'll see the effect of this format change immediately, as the balance changes to 1069.70.

Checks and Balances

Now you can start filling in checks and deposits. At R6C1, enter the first check number for January. From Figure 3, this would be 1069. As soon as you press ENTER, you'll see that we need to make an adjustment in the model: The system has put 1069.00 under check number. This is because of the new default format which is fine for dollars and cents but not so great in the first column of this model. What to do? You can change the format of the cells in column 1 to be whole numbers (integers). Choose the command FORMAT and then option CELLS. To change all the cells in column 1, type C1 where the system says FORMAT CELLS:, then TAB over to alignment and change it to General by typing G. TAB to format code and type I for integer, and then press ENTER. Watch as the system changes the check number to 1069.

Now arrow over to R6C2 and enter the payee for check 1069 (HomeRlty in Figure 3). This check for 250.00 was a rent expense, so enter 250 in the Rent column of row 6 (R6C4). Now we want to have the system calculate the new balance and put the answer in the Balance column on Row 6. Let's think about this for a minute. Check 1069 just happened to be *entirely* for rent, so the check amount is at R6C4. Some checks, however, may be split among two or more expenses. So what we really want for the balance on this row

is the balance from the previous row, minus the sum of any expenses on this row. Some rows will show income instead of expenses, so we need to enter a general formula here because the equation for the balance in row N should be the balance from row N-1 *plus* the income in row N, minus the sum of the expenses in row N!

If you are starting to get confused, don't worry; this is harder to say than it is to do with *Multiplan*. Put the cell pointer at R6C10, where the balance to be calculated belongs. Now press = to tell the system you're going to enter a formula. The first term in the formula is the balance from the row above. Use the UP arrow to move the cell pointer to the above balance. You will see the expression R[-1]C in the command line. This notation means "The cell at Row -1 in the same column." This is just right for the first term. Next we want to have the system add in any income from the current row. Hit + and the cell pointer pops back down to R6C10 (where we started building the formula), and the formula is now R[-1]C+. Select the income amount for the same row by left-arrowing until you're in the Income column. Notice that the formula is now R[-1]C+RC[-7]. Since Income is in column 3 and Balance is in column 10, you can see why *Multiplan* expresses this as column minus 7.

Figure 3

Checks During January								
Check#	Paid to	Income	Rent	Food	Clothes	School	Fun	Other
Forward								739.70
1069 HomeRlty			250.00					489.70
1070 ShedRite				34.12				455.58
Deposit	550.00							1005.58
1071 Emborium					119.75		29.95	855.88
1072 Time's				22.50			7.50	825.88
1073 U of D						375.00		450.88
1074 Dalton						32.60		418.28
Totals	550.00	250.00		56.62	119.75	407.60	37.45	12.50

Now for the formula's third term. We want to subtract the sum of any expenses in the same row from the balance. Press -, and the formula becomes R[-1]C+RC[-7]-. We will use the special function called SUM to get the sum of the expenses. When you use SUM, you must tell *Multiplan* what cells to add together in a FROM: TO expression. Type SUM(and then indicate the first cell to include in the sum by left-arrowing until you're under Rent (R6C4). The formula will now be R[-1]C+RC[-7]-SUM(RC[-6]. Type : to show that you're ready to put in the last cell to include in the sum. The system will pop the cell pointer back to R6C10. Left-arrow once to select the *other* column, that is, the last cell of the group of expenses to be added together. Finally, type) to close the SUM expression and then press ENTER. The finished formula is R[-1]C+RC[-7]-SUM(RC[-6]:RC[-1]).

Multiplan will calculate the balance and fill in R6C10. The formula applies only to R6C10, but we'd like it to be used on every row in the balance column. Since we have expressed

Continued on p. 39

ASSEMBLY LANGUAGE TEXT PROCESSING: COMPANION

A lightning fast writer-oriented word processor which treats your text conceptually. Type it as one long phrase: COMPANION completely reformats it for printout, subject to simple text-imbedded commands which continuously dictate the desired format and printer mode. ALL text manipulation routines in TRUE ASSEMBLY LANGUAGE.

- MENU driven ■ SEVEN cursor motion keys ■ Excellent FULL-SCREEN editor ■ ACCELERATING auto-repeat
- 18000 character memory CAPACITY ■ Virtually INSTANTANEOUS correction, deletion, and insertion
- Text imbedded commands provide CONTINUOUS control of ALL FOUR margins, indentations, spacing, form width, etc.
- COMPLETE control of printer mode ■ Prints ANY ASCII character, codes 0-255 ■ Automatic CENTERING
- UltraFAST loading ■ FULL ERROR RECOVERY ■ EIGHT completely independent tab sets ■ DETAILED manual
- Prints on almost ANY modern tractor feed printer ■ Page numbering: AUTOMATIC or suppressed
- Flexible BATCH PROCESSING capabilities ■ Ph.D. designed, written, and documented ■ WRITE for free brochure
- Requires 99/4A, Extended Basic (new version, Version 110), RS232, Disk Drive & Controller, Memory Expansion

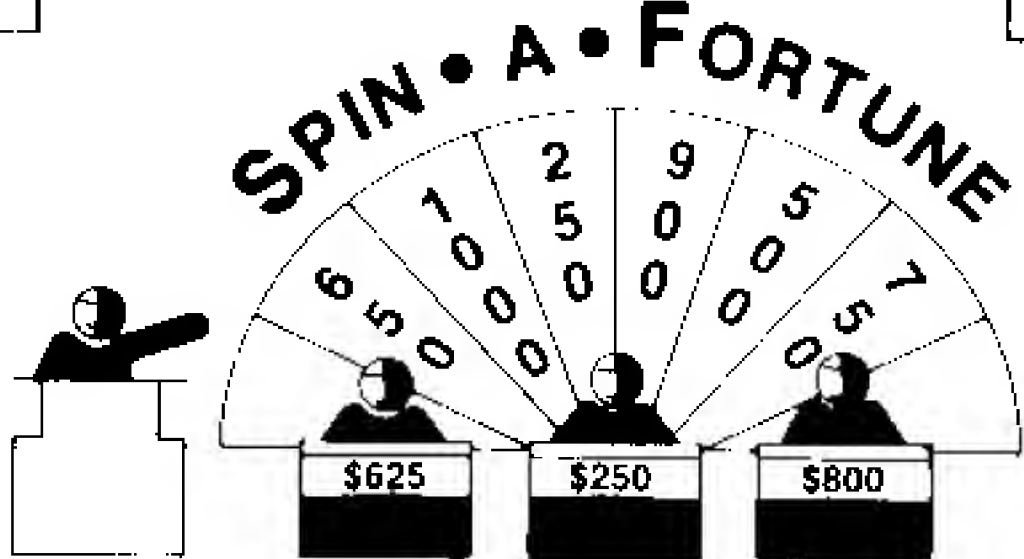
Diskette \$64.95

5825 Baillargeon St., Brossard, Quebec, Canada

INTELPRO

(514)-656-8798

J4Z 1T1



The first TV game show simulation for the 99/4 (A). Spin the money wheel, guess letters and solve the puzzles for big payoffs in fun and excitement. The whole family will love **SPIN • A • FORTUNE**. Not just another computer game.

- 180 Puzzles in MINIBASIC Data List
- Can't be read by listing program
- 2nd Cassette contains 180 more puzzles in file
- Make your own files, insert tape and go
- Unique graphics effects, graphics, and sound

ONE OF THE MOST ENTERTAINING PROGRAMS
AVAILABLE IN TI BASIC

For 2-4 Players. Requires no peripherals except cassette recorder.

SUNRISE SOFTWARE \$12⁹⁵

P.O. Box 5010
Springfield, Va. 22150

2 CASSETTE
TAPES +\$1 shipping

WIRE WRAP PROTOTYPE BOARD PROTOTYPE KIT BUS EXTENDER CARD

SAT 4512 Wire Wrap Prototype Board

Supports as many as 48 20-pin devices plus regulators and associated capacitors; and is designed to be used with T.I.'s peripheral expansion box. Varieties of 8, 14, 16, 18, 20, 24, 40, and 64 pin devices also can be installed. \$48.50

SAT 4513 Prototype Kit

Contains 15 3-level wire wrap sockets; wire wrap I.D.'s; +5; ±12 regulators and associated capacitors, 100 pins and 20 decoupling capacitors. \$39.95

SAT 4511 Bus Extender

Used to facilitate check out/repair of cards used in the T.I. peripheral expansion box. \$48.50

Coming Soon . . .

MEMORY EXPANSION BOARD

SPACE AGE TECHNOLOGY INC.

P.O. Box 30 • 215 W. Garst • South Bend, IN 46624

To Order Call: 1-800-348-5000

In Indiana Call: 1-800-552-2277

Visa/MasterCard Accepted

No C.O.D.

Lost Ruins . . . from p. 29

```

2250 R=2
2260 C=16
2270 CHARGES=10
2280 R1=23
2290 C1=27
2300 A$=STR$(CHARGES)
2310 GOSUB 2580
2320 READ A,B
2330 DATA 750,117,750,117,183,117,5
58,117,750,139,183,131,558,131
,183,117,558,117,750,110,1500,
117,0,0
2340 IF A=0 THEN 2370
2350 CALL SOUND(A,B,0)
2360 GOTO 2320
2370 IF MINER>0 THEN 770 ELSE 2640
2380 NEXT I
2390 IF CHARGES=0 THEN 2720 ELSE 86
0
2400 IF CHARGES>0 THEN 2470
2410 CHARGES=10
2420 R1=23
2430 C1=27
2440 CALL HCHAR(23,27,32,3)
2450 A$=STR$(CHARGES)
2460 GOSUB 2580
2470 TOTAL=10*(MNUG*CHARGES)+TOTAL
2480 MNUG=0
2490 R1=2
2500 C1=24
2510 A$=STR$(TOTAL)
2520 GOSUB 2580
2530 CALL HCHAR(23,12,32,5)
2540 IF SNUG>0 THEN 860
2550 SCREEN=SCREEN+1
2560 GOTO 210
2570 CALL HCHAR(23,12,32,5)
2580 REM PRINT AT ROUTINE
2590 FOR Z=1 TO LEN(A$)
2600 B$=SEG$(A$,Z,1)
2610 CALL HCHAR(R1,C1+Z,ASC(B$))
2620 NEXT Z
2630 RETURN
2640 REM PLAY AGAIN
2650 CALL CLEAR
2660 PRINT "THE ARTIFACTS YOU HAVE"
: "ARE WORTH ";TOTAL;" CREDITS!"
: ":::::"WANT TO PLAY AGAIN ? ("
Y/N) "::"
2670 CALL KEY(3,KEY,ST)
2680 IF ST=0 THEN 2670
2690 IF KEY=78 THEN 2710
2700 IF KEY=89 THEN 3910 ELSE 2670
2710 END
2720 REM TIMED MOVE SEQUENCE
2730 TIME=0
2740 TIME=TIME+1

```

```

2750 IF TIME=40 THEN 2180
2760 CALL KEY(1,KEY,ST)
2770 IF ST=0 THEN 2820
2780 IF KEY>5 THEN 2740
2790 IF KEY>1 THEN 2810 ELSE 2800
2800 KEY=0
2810 ON KEY+1 GOTO 2990,2740,2920,3
060,2740,2850
2820 CALL JOYST(2,X,Y)
2830 KEY=((X+3*Y)/4)+5
2840 ON KEY GOTO 2740,2990,2740,292
0,2740,3060,2740,2850,2740
2850 IF R-1<2 THEN 2740
2860 CALL GCHAR(R-1,C,CH)
2870 IF (CH=32)+(CH=132)+((CH>111)*
(CH<118)) THEN 2880 ELSE 2740
2880 IF CH=132 THEN 2400
2890 CALL HCHAR(R,C,32)
2900 R=R-1
2910 GOTO 3120
2920 IF C-1<1 THEN 2740
2930 CALL GCHAR(R,C-1,CH)
2940 IF (CH=32)+(CH=132)+((CH>111)*
(CH<118)) THEN 2950 ELSE 2740
2950 IF CH=132 THEN 2400
2960 CALL HCHAR(R,C,32)
2970 C=C-1
2980 GOTO 3120
2990 IF R+1>22 THEN 2740
3000 CALL GCHAR(R+1,C,CH)
3010 IF (CH=32)+(CH=132)+((CH>111)*
(CH<118)) THEN 3020 ELSE 2740
3020 IF CH=132 THEN 2400
3030 CALL HCHAR(R,C,32)
3040 R=R+1
3050 GOTO 3120
3060 IF C+1>32 THEN 2740
3070 CALL GCHAR(R,C+1,CH)
3080 IF (CH=32)+(CH=132)+((CH>111)*
(CH<118)) THEN 3090 ELSE 2740
3090 IF CH=132 THEN 2400
3100 CALL HCHAR(R,C,32)
3110 C=C+1
3120 IF CH=32 THEN 3260
3130 SNUG=SNUG-1
3140 IF (CH<>112)*(CH<>113) THEN 317
0
3150 MNUG=MNUG+3
3160 GOTO 3220
3170 IF (CH<>114)*(CH<>115) THEN 320
0
3180 MNUG=MNUG+5
3190 GOTO 3220
3200 IF (CH<>116)*(CH<>117) THEN 322
0
3210 MNUG=MNUG+1
3220 R1=23
3230 C1=12
3240 A$=STR$(MNUG)

```


● 32K Memory Expansion ● ● RS232 Interface ●

Expand your TI99/4(A) system *without* the peripheral expansion box.

32K Memory Add On — Our most popular model.

- This model attaches to the right of the TI99/4(A) console. The 32K Memory Add On has a port on the right side that allows the use of other peripherals, including speech synthesizer, peripheral expansion box and hex bus adapter.

Model 2000 \$175.00

32K Memory Card

- For use in the TI Peripheral Expansion Box.

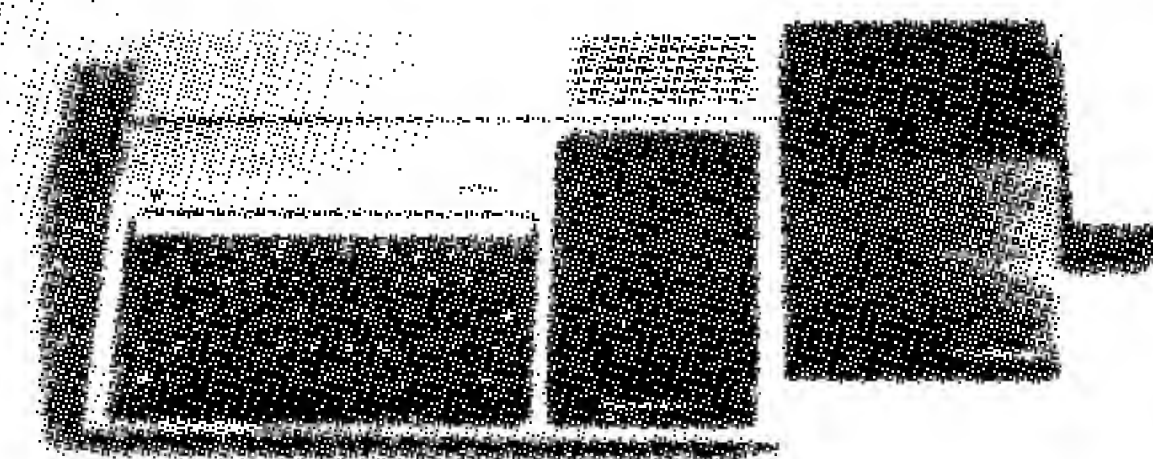
Model 1000 \$130.00

RS232 / 32K Memory Combination

- This model combines an RS232 interface with our 32K Memory Add On unit. It attaches to the right of the TI99/4(A) console and has a port on its right side as well.

Model 2100 Call or write for price.

* If not completely satisfied return within ten days for full refund.



Model 2000 attached to console and Speech Synthesizer

- All models are compatible with all TI hardware and software
- 90 day warranty
- Shipping prepaid anywhere in the U.S.
- Use Mastercard / VISA / or C.O.D.
- Utah residents add 5% Sales Tax

Intellitec Computer Systems

2337 Bonanza Court • Riverton, Utah 84065
(801) 254-2333

```

3250 GOSUB 2570
3260 CALL HCHAR(R,C,64)
3270 CALL SOUND(100,-5,0)
3280 IF R=2 THEN 2400
3290 GOTO 2740
3300 REM TITLE SCREEN
3310 PRINT TAB(9);"LOST RUINS":;TAB
B(7);"BY B. J. BRUNS":;:
:
3320 FOR I=1 TO 450
3330 NEXT I
3340 CALL CLEAR
3350 RESTORE 3440
3360 CALL CLEAR
3370 REM PRINT INTRO & PLAY SONG
3380 PRINT " WELCOME TO EARTH 9999
AD.":;"MAN HAS REACHED OUT TO
THE":;"STARS AND LOST TRACK O
F HIS":;
3390 PRINT "HOME PLANET.":;
3400 PRINT " YOUR ROBOTS HAVE SEAR
CHED":;"MANY GALAXIES LOOKING
FOR":;"THE PLANET FROM WHICH M
AN":;
3410 PRINT "WAS BORN. FINALLY THE Q
UEST":;"MAY BE OVER, IF YOU CA
N FIND":;"ENOUGH EVIDENCE.":;
3420 PRINT "PRESS ENTER TO START"
3430 CALL KEY(0,K,S)
3440 IF (K=13)*(S<>0) THEN 3460
3450 GOTO 3430
3460 REM SET COLORS, CHAR & VARIAB
LES
3470 CALL CLEAR
3480 CALL CHAR(64,"18187E5A5A242424
")
3490 CALL CHAR(91,"18187E7E18181818
")
3500 CALL CHAR(104,"814224181824428
1")
3510 CALL CHAR(105,"B04020100B04020
1")
3520 CALL CHAR(106,"010204081020408
0")
3530 CALL CHAR(112,"0003047C7FFF381
0")
3540 CALL CHAR(107,"FFFFFFFFFFFFFFF
F")
3550 CALL CHAR(113,"00F0BBBFFFFFF1C0
B")
3560 CALL CHAR(114,"0804053D35041C2
0")
3570 CALL CHAR(115,"000748704807")
3580 CALL CHAR(116,"0000181E5EFB63"
)
3590 CALL CHAR(117,"00043C7E7EF7C6"
)
3600 CALL CHAR(120,"118420019004214
4")

```

```

3610 CALL CHAR(125,"118420019004214
4")
3620 CALL CHAR(128,"0000000000030CF
0")
3630 CALL CHAR(129,"010718207FB0194
A")
3640 CALL CHAR(130,"B0E01804FE01985
2")
3650 CALL CHAR(136,"00FF929261")
3660 CALL CHAR(137,"00FF92929261")
3670 CALL CHAR(138,"00FF9292929261"
)
3680 CALL CHAR(139,"00FF92929292926
1")
3690 CALL CHAR(140,"00FF494986")
3700 CALL CHAR(141,"00FF49494986")
3710 CALL CHAR(142,"00FF4949494986"
)
3720 CALL CHAR(143,"00FF49494949498
6")
3730 CALL CHAR(131,"00000000000C0300
F")
3740 CALL CHAR(132,"0C03")
3750 CALL CHAR(133,"00FF9261")
3760 CALL CHAR(134,"00FF4986")
3770 CALL CHAR(135,"30C0")
3780 SH1$=CHR$(128)&CHR$(129)&CHR$(
130)&CHR$(131)
3790 SH2$=CHR$(132)&CHR$(133)&CHR$(
134)&CHR$(135)
3800 CALL COLOR(10,7,13)
3810 CALL COLOR(12,4,13)
3820 CALL COLOR(13,7,1)
3830 CALL COLOR(14,7,1)
3840 CALL COLOR(11,2,13)
3850 FOR TD=1 TO 20
3860 TB=INT(RND*23)+1
3870 PRINT TAB(TB);SH1$
3880 PRINT TAB(TB);SH2$::
3890 NEXT TD
3900 PRINT ::
:
:
3910 R=2
3920 C=16
3930 PO=1
3940 TOTAL=0
3950 CHARGES=10
3960 SCREEN=0
3970 MINER=3
3980 MNUG=0
3990 REM PRINT SCREEN HEADING
4000 PRINT TAB(22);"SCORE":TAB(23);
"00":;:
:
4010 PRINT "ARTIFACTS 0 CHARGE
S 10"
4020 GOTO 210

```

PERSONAL FINANCE programs for TI-99 4(A)

THE PERSONAL LEDGER
TI BASIC
THE PERSONAL REGISTER
TI Extended BASIC

Monitor monthly expenditures
without peripheral equipment!
(only cassette recorder required)

UTILITIES, CHARGE ACCOUNTS, & MORE

Graphs and charts illustrate changes in
cost and consumption.

Store the year's financial file on one
economical cassette.

TWENTY DOLLARS each, postpaid
(6% sales tax for Minnesotans)

Tyte Innovative
Software

4704 Blaisdell Avenue South
Minneapolis, Minnesota 55409



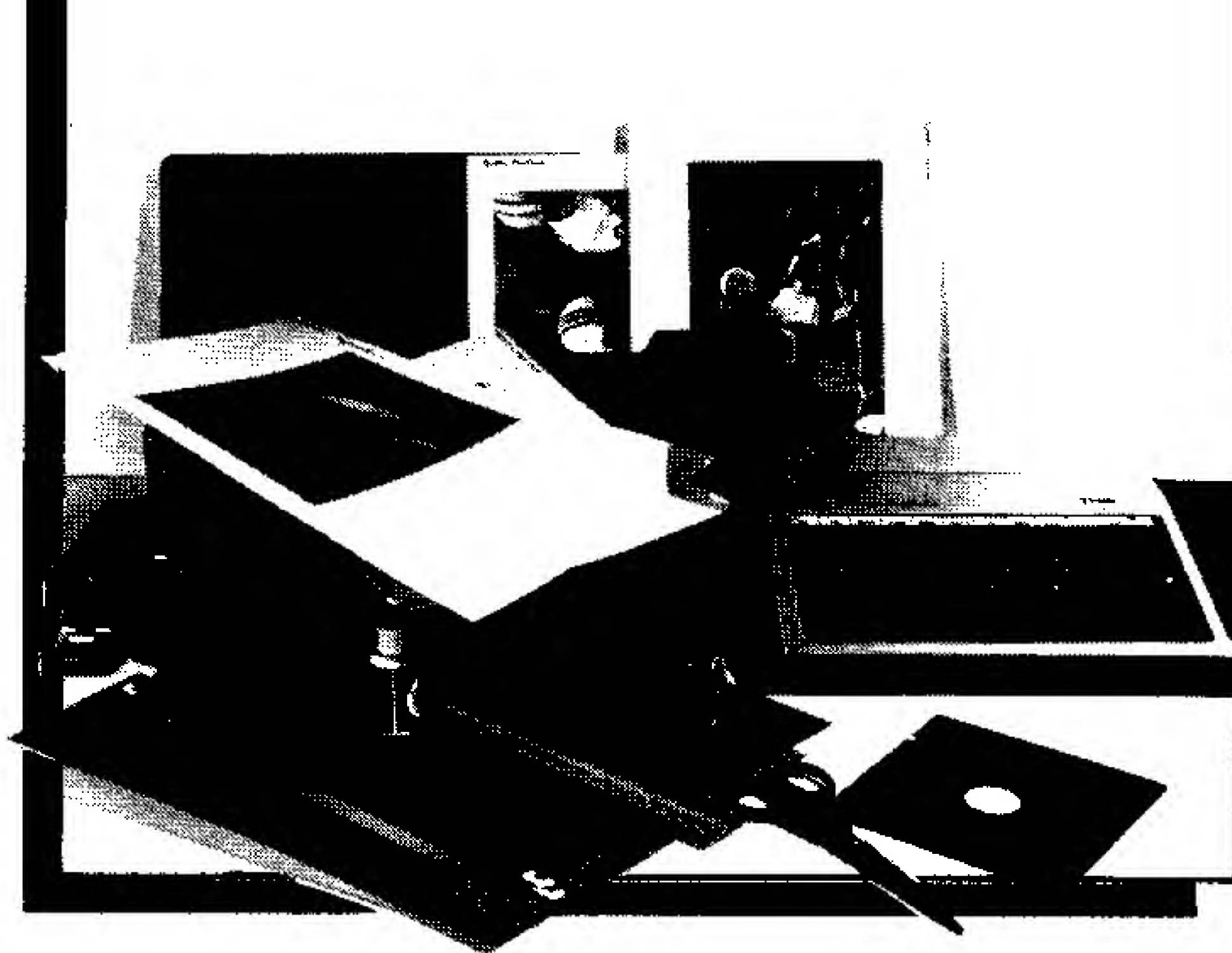
SERVING 99/4A USERS

- * OVER SIX HUNDRED PROGRAMS IN OUR OWNER WRITTEN AND TRANSLATED SOFTWARE CATALOG! ONLY \$2 PER PROGRAM
- * FOR THOSE WHO SUBMIT PROGRAMS THE EXCHANGE RATE IS 5 FOR 1
- * AN INFORMATIVE NEWSLETTER
- * WE SERVE OWNERS OF BASIC SYSTEMS AND ADVANCED SYSTEMS

SEND YOUR ONETIME
MEMBERSHIP FEE OF \$10 TO:

THE 99/4(A) PROGRAM EXCHANGE
P.O. BOX 3242
TORRANCE, CA 90510
• MASTER CARD/VISA ACCEPTED •





THE SCHOOL SECRETARY'S SECRETARY

A Review of Scott, Foresman's
School Management Application
Activity Accountant

By Sharyn Lyon

Name: School Management Applications:
Activity Accountant
Program Type: School Business Applications
Producer: Scott, Foresman & Co.
Price: \$275.00

System Requirements:
32K Memory Expansion
RS232 Interface
TI Printer
Disk Drive Controller
Disk Drives (2)

	Poor	Fair	Good	Excellent
Documentation	████████████████████			
Error Handling	████████████████			
Performance	████████████████			

Remember the last time you walked into a school office? There was the secretary surrounded by clamoring students, hurried teachers, and piles of paperwork, trying to assign keys, schedule activities, bandage physical and emotional hurts, and grab a little time to help enrich the academic environment. It is no wonder that school secretaries (and teachers) wish for secretaries of their own so they can spend more time helping the students. Well, the long awaited relief is here thanks to Scott, Foresman & Co. It has created *School Management Applications*, a series of software packages carefully designed to reduce the headaches of the school secretary's most detailed and tedious jobs.

The school secretary is involved to one degree or another in the students' extracurricular activities: PTA events, field days, sports events, clubs. Each of these activities requires extensive recordkeeping for which she is responsible—budget, expense and income records. It is no wonder that many would-be extracurricular treasures are left buried. Secretaries and teachers do not have time to dig them out of this bureaucratic mud. Having *Activity Accountant* to help keep activity financial records for you is like slashing your way through mountains of paperwork with a bulldozer!

First Impressions

Immediately upon picking up the software, you will notice everything you need is provided in a well-organized, durable package. In fact, the documentation looks too small to contain all the particulars. Scott, Foresman has condensed all of the required users manuals into one relatively short piece of documentation. *Activity Accountant* (and all the *School Management Applications*) require you to invest in and use the specified hardware components. Although you can use either a 99/4 or 99/4A computer console and a TV instead of TI Video Display Monitor, substitutions should not be made for the printer. You must use the TI 825 or TI 840 printer pictured in the manual. Otherwise

it is not possible to use the manual or perform the crucial system checks.

In addition to extensive system checks in the manual, there is a Disk Check built into the beginning of the software that guards against improper use of diskettes. This also serves as a final check on whether any human errors have been made in managing the hardware. The program will not leave the Disk Check mode until all diskettes are properly initialized and inserted, and all the hardware is properly set up. If the program gets stalled here, carefully check the items listed in the display titled DISK ERROR. Leave no stone unturned; the display is deceiving in its simplicity. Pay particular attention to the word ALL in reference to power, cables and disk drive doors. You can waste valuable time and energy looking for complicated problems if you aren't thorough in this first system check.

As soon as you have ENTERED all accounts, you can have the system generate a printout for the Chart of Accounts. The printer will provide you with a list of all schools and accounts with their code numbers. This information is used frequently as you work on the application, so keep this Chart of Accounts close to the console for quick and easy referral.

Documentation

The documentation is easy to follow, accurate, and complete, which is a small miracle when you consider that within its modest sixty pages are separate instructions for operating all hardware components of the system and running the software. There is even an explanation of the diskette. It is like getting at least seven manuals for the price of one.

The first part, *Your School Management System*, is devoted to the hardware. The novice will find that troubleshooting is, if not easy, at least manageable, due to the quick access design of the contents (p.3). Each piece of hardware has its own section and is emphasized in the contents by boldface type. It is advisable to read through the 31 pages of Part I *before* trying to set up the system. The words in the directions are carefully chosen and were meant to be carefully read and followed.

Using Activity Accountant, the second section, tells how to use the software. It is also carefully written, complete and deceptively simple. You can tell where this software section begins at a glance because all of its pages are edged with blue. To let you review quickly what each procedure does, each one is designated by a title in blue print. The use of blue printed subheadings continues throughout the documentation and makes it a ready and reliable reference tool.

The documentation contains many screen displays that help clarify what the user should focus on when certain on-screen prompts are displayed. Perhaps the most disconcerting is the screen bearing the DISK ERROR title. This display lists four things to check that could be preventing the software from running properly, but it cannot list all the possibilities. If you check these four items and you are still getting this screen, then go back to pages 29-31 of the manual and perform all those checks again.

We recommend that you pay close attention to the following items in the documentation:

1) When changing from the *Disk Manager* cartridge to the

Activity Accountant cartridge, take care to avoid losing data by always pressing FCTN 5 (BEGIN) to go back to the Disk Manager main menu and then pressing FCTN 9 (BACK) to close the diskette files and return to the Master title screen.

2) Review the other precautions to protect data on your diskettes on page 17.

3) Review *Checking Your System* (page 29) before entering data for the first time.

4) The documentation reminds you to never use FCTN + (QUIT) but to always use E (END) to leave the application or one of its branches. It is worth repeating again here to underscore the importance of following this advice to avoid loss of data.

The manual is written to be used with a TI-99/4 console and has been amended for the modified TI-99/4A keyboard with a one page insert that "translates" the key functions from the 99/4 to the 99/4A. Those who are used to a 99/4 keyboard will want to keep the keyboard insert close to the console for the "special reminders" it also lists. This list of six forget-me-nots draws attention to the differences between working with a typewriter and a computer. It also points out crucial usages for this specific cartridge. If you are not sure how working with *Activity Accountant* is supposed to progress, check the helpful Flow Chart (pp. 54-55) in the manual. If you are careful, you will find that the software performs in a quick, clear, smooth and accurate manner with few, if any, "surprises."

Performance

Perhaps the most exciting part of *Activity Accountant* is the time and effort you will save by using it. Imagine trying in one day to fulfill central administration's typically urgent request to send them a report of all the receipts and expenditures for all the school activities in each school (with their beginning and current balances tabulated) for a Board of Education meeting that night! Certainly, it could be done with a team of four people (2 secretaries, an accountant, and a bookkeeper) who work on nothing else that day. Such person power and time are luxuries that do not exist in school systems—until now. It will only take *Activity Accountant* about ten minutes to fulfill such a request, and while the computer works, you can be talking to the Superintendent on the telephone assuring him that all will be ready in time!

"Having *Activity Accountant* to help keep activity financial records for you is like slashing your way through mountains of paperwork with a bulldozer!"

There are as many ways to use this application as there are school districts to use it. On pages 56-57 the manual offers some suggested uses. One intriguing possibility they mention is to use two disks to keep track of sports budgets with accounts labeled by school and sport. If the district is small, you may want to use the *school* prompt to mean *department* instead. With so many districts becoming active in Community Education programs, the agency sponsoring such a program could use *Activity Accountant* to maintain financial records for the numerous activities that make up a Community Education program. Whichever way you decide to use the application, you can be sure that the data you store will be up-to-date and secure.

Continued on p. 38

SAVE

SOUTHERN AUDIO VIDEO ELECTRONICS, INC.
1782 Marietta Blvd., N.W., Atlanta, Georgia 30318

Royal Alpha Interface 2001A Daisy Wheel Printer* — \$495.00



*With port to interface with TI 99/4A.

Five print types available; 100 character keyboard (48 keys) with all keys electronically repeatable; automatic carriage return and line spacing; one touch tab clearance; page end indicator on paper support, plus many other features.

Maxell Mini Disk 5 1/4"

MD-2D Double sided, double density. For use on TI Shugart or equivalent (10 pk.) \$47.50

MD-1 Single sided, single density for mini floppy disc drives (10 pk.) \$33.50

Panasonic Color Monitor—CT 160—\$295.00

- Composite dual mode 10"
- Full color display for graphics and video games
- Clean monochrome display with flick of switch for data display

Panasonic TR120—\$174.00

- High resolution monochrome 12" monitor
- High resolution green P31 phosphor providing optimum character display
- Produces 80 x 28 characters
- Built-in audio system
- Monitor cables available \$15.00

Signalman Mark III Modem—\$89.95

Direct connect telephone modem for TI 99/4 & 99/4A works with Bell modular phones only.

Shugart SA400 Mini Floppy® Disk Drive —\$260.00

Compact, single and double density capability, 125/250KByte (unformatted) storage.

SA450 Doublesided, double density Mini Floppy—\$329.00

Compact, single and double density capability 250/500 Byte (unformatted) storage.

Shugart's 400 & 450 features: Low heat dissipation • DC drive motors • Positive media insertion • Write, protect circuitry • Activity light

Get the best prices on hardware and software. For a complete listing of all SAVE's products, send \$5.00 for our catalogue (refundable with your first order).

Enjoy the convenience of in-home shopping. Call our toll free number today.

Use your American Express, VISA, Mastercard, check or money order. Minimum order of \$50. Shipping and handling charges are extra. All prices are subject to change without notice. Allow 2-4 weeks for delivery. Prices good through May 15, 1983.

**Order Toll Free 1-800-241-2682
In Georgia (404)-351-8459**

BeeJay FUNWARE

BLACKJACK - One or two players against the house. Follows all Vegas rules. Excellent graphics. Multiple decks. We know you will like this one!

BLACKJACK II(*) - Play blackjack with a friend - on the telephone! We are first with remote games for the 99/4A

CALENDAR - On what day of the week will your birthday fall in 2001? In 1,000,000? This program explains our gregorian calendar system and will draw a calendar for any month of any year, even BC! It highlights the holidays and you can add your own special dates - permanently! Another BJJ original!

MINIGOLF - 18 holes of miniature golf for 1 or 2 players. 64 different greens. No 2 consecutive holes or games are the same. Challenging and fun!

MINIGOLF II(*) - Play golf with a friend - on the telephone! A fine use for your comm gear!

XORKLE - A six-dice game for up to 6 players. A unique challenge to your daring and judgment! Can you throw a triple? If you XORKLE you've blown your turn! A BeeJay Funware original.

XORKLE II(*) - Play XORKLE on 2 home computers over the phone! Up to three players at each location.

(*) requires RS232 interface, modem & a fellow 99'er similarly equipped. Each player must have a copy of the program (order two). All programs require Extended Basic. Multiple programs furnished on same tape or disk.

***** Prices *****
1 PROGRAM...\$12.95 2 PROGRAMS...\$16.95
4 PROGRAMS \$21.95 PLEASE ADD \$1.50 SHIPPING
Colorado residents please add 6.5% sales tax.

BeeJay FUNWARE

P.O. Box 27643

Denver, CO 80227 303-979-6193

SATISFACTION GUARANTEED

COMPUTER / BASF CASSETTES / -DPS

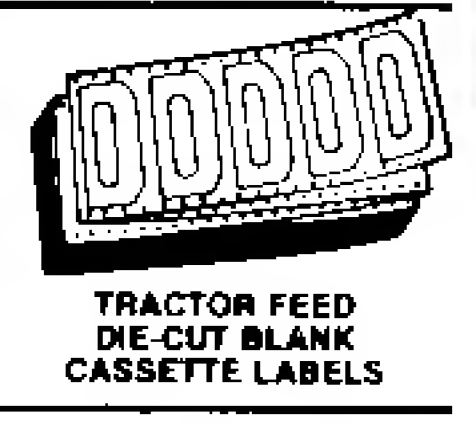
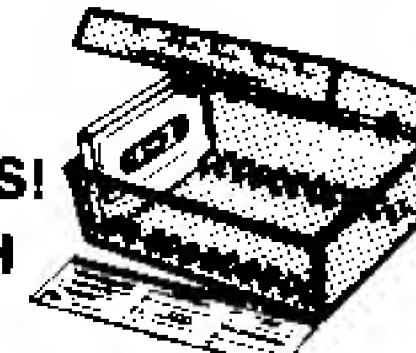


THE WORLD'S FINEST

- Data media for all microcomputers
- Used nationwide by software manufacturers, hobbyists, schools and businesses
- Premium 5-screw shell with leader fits all standard recorders

CASSETTE STORAGE CADDY

NEW!
ORGANIZE YOUR TAPES!
\$2.95 EACH



GET ONE CADDY FREE! Buy 2 doz. Cassettes & One Caddy. Get One Caddy FREE!
OFFER EXPIRES AUGUST 1, 1983

• **SATISFACTION GUARANTEED OR YOUR MONEY BACK** •
FOR IMMEDIATE SHIPMENT
USE YOUR VISA OR MASTERCARD **CALL 213/710-1430**

ORDER FORM

ORDER NOW... MAIL TO: YORK 10™ Computerware

24573 Kittridge St., #99, Canoga Park, CA 91307

ITEM	1 DOZEN	2 DOZEN	TOTAL
C 05	7.50	13.50	
C 10	8.00	14.40	
C 20	10.00	18.00	
Hard Box	2.50	4.00	
Storage Caddy \$2.95 ea. Quantity			
FREE Quantity			
Blank labels 4 00/100 30 00/1000			
SUB TOTAL			
TOTAL			

Each cassette includes two YORK 10 labels only. Boxes are sold separately. Shipments are by U.P.S. unless Parcel Post requested. Boxes, caddies, and blank labels are free of shipping charges when ordered with cassettes. When ordered without cassettes, shipping charges. Boxes—\$1.00 doz., Caddies—\$1.00 each. MINIMUM SHIPPING/HANDLING ON ANY ORDER—\$2.00

Check or M.O. Charge to Credit Card: enclosed VISA MASTERCARD
PLEASE SEND QUANTITY DISCOUNTS

Name _____
Address _____
City _____ State/Zip _____
Card No. _____ Exp. _____
Signature _____

Pewterware

PRESENTS

MATCH WITS

THIS IS A GAME OF
CONCENTRATION FOR 1 TO 4
PLAYERS. TAKE TURNS TRYING
TO MATCH PAIRS OF COLORED
PICTURES. EVERY ONE YOU
MATCH IS ONE POINT AND EVERY
ONE OF YOUR OPPONENTS THAT YOU
MATCH IS WORTH DOUBLE.

MATCH WITS (BASIC/CASSETTE).....\$10

OTHER GAMES AVAILABLE: FROM:
BLUEGRASS SWEEPSTAKES (BASIC) \$10 PEWTERWARE
CHALLENGE POKER (BASIC) \$10 POST OFFICE BOX 503
DECATHLON (BASIC) \$10 GULF BREEZE, FL 32561
UP PERISCOPE (EXTENDED BASIC) \$15 DEALER INQUIRIES INVITED

**MANUFACTURER'S REPRESENTATIVES
NEEDED TO MARKET HIGH QUALITY PEWTERWARE
SOFTWARE PROGRAMS FOR THE TEXAS INSTRUMENTS
TI-99/4(A). ESTABLISHED EXPERIENCE WITH COMPUTER
OUTLETS DESIRED. ALL FOUR U.S. REGIONS AVAILABLE.**

SEND RESUME TO:

MR. TOM KROHN

PEWTERWARE COMPUTER SOFTWARE
POST OFFICE BOX 503
GULF BREEZE, FL 32561

Come Work & Play In A Unique Environment...

Follow the Oregon Trail
to the Beautiful Willamette Valley

Join a Dynamic Team
of Creative Individuals
Who Thrive on Challenge
and Cherish Their
Quality of Life.

We are offering—

- Technical Writers/Editors
 - Software Engineers
 - Logic Designers
 - Applications Programmers
 - Advertising & Marketing Professionals
- The Opportunity of a Lifetime

Send your resume in strictest confidence to:

99'er Talent Hunt

Emerald Valley Publishing Co.
1500 Valley River Drive, Suite 250
Eugene, Oregon 97401



TEXAS INSTRUMENTS HOME COMPUTER

Retail price \$225. Your special BACH Company price is a low \$149.95. Less TI \$50 REBATE - \$99.95! Order today TOLL FREE 800-227-8292. In California call 415-969-6600.

TI Home Computer	(includes rebate) 99.95
Peripheral Expansion System	182.95
RS-232 Card	134.95
Disk Controller Card	192.95
Expansion System Disk Drive	297.95
Maxell MD1 Single Side 5-1/4" Floppy Disk (10) ..	29.10
Memory Expansion Card	228.95
P-Code Card	189.95
Pascal Development System	370.50
Solid State Speech Synthesizer	108.95
Telephone Coupler	158.95
TI-Impact Printer	559.00
10" Color Monitor	319.95

**TOLL FREE
800-227-8292**

**CALL FOR
FREE TI
SOFTWARE
LIST!**



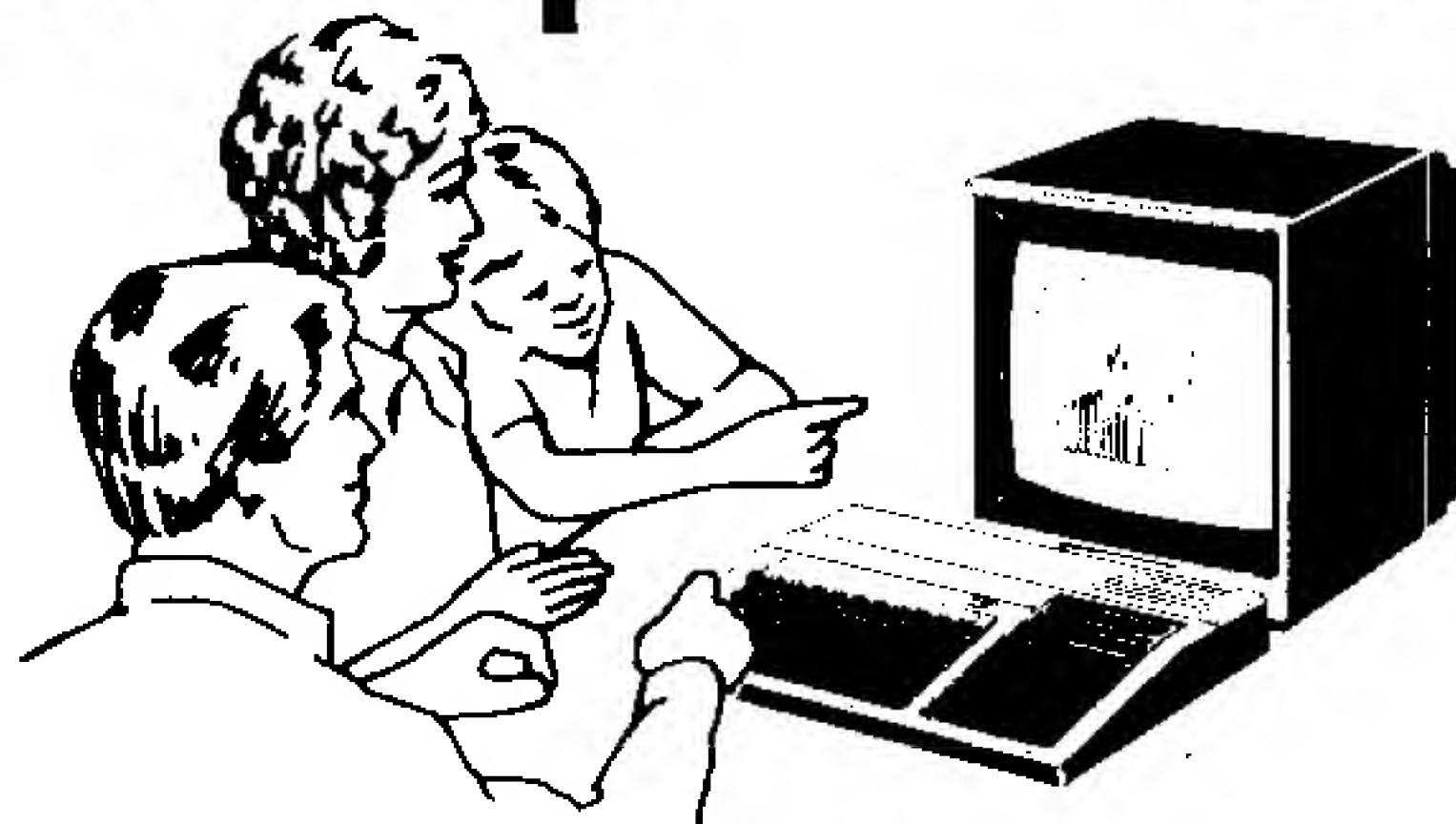
99/4A

The BACH Company
715 ENSIGN WAY, PALO ALTO, CA 94303

99'er BUYERS GUIDE™

A Bound-In Supplement for Subscribers
of 99'er Home Computer Magazine

Computer Dealers Wanted



**For the Most Wanted Home
and Small Business
Computers
Texas Instruments 99/4A
Computers from Keystone
Distributing Company**

Dealing with Keystone is like Dealing Direct!*

Keystone Distributing, one of the largest distributors of Texas Instruments products has a complete inventory of TI computers, software, peripherals, calculators, and educational products ready for shipment immediately!

Texas Instruments 99/4A computer gives an unmatched combination of features including more languages than any other computer on the market in its price category.

If you are now paying more for other computers, software, peripherals, calculators, and educational products, but are making less—go for the best! Texas Instruments computer products distributed by Keystone Distributing Company of Norwood, Mass.

"GO FOR IT!" Call or Write:

KEYSTONE DISTRIBUTING

51 Morgan Drive
Norwood, Massachusetts 02062
Call: 1-617-769-3225 or outside Massachusetts 800-343-9030

*We sell wholesale only to qualified dealers.
F.O.B. Norwood, Mass. Please have your tax number ready when calling.



**TEXAS INSTRUMENTS
INCORPORATED**

BeeJay FUNWARE

BLACKJACK - One or two players against the house. Follows all Vegas rules. Excellent graphics. Multiple decks. We know you will like this one!

BLACKJACK II(*) - Play blackjack with a friend - on the telephone! We are first with remote games for the 99/4A

CALENDAR - On what day of the week will your birthday fall in 2001? In 1,000,000? This program explains our gregorian calendar system and will draw a calendar for any month of any year, even BC! It highlights the holidays and you can add your own special dates - permanently! Another BJF original!

MINIGOLF - 18 holes of miniature golf for 1 or 2 players. 64 different greens. No 2 consecutive holes or games are the same. Challenging and fun!

MINIGOLF II(*) - Play golf with a friend - on the telephone! A fine use for your comm gear!

XORKLE - A six-dice game for up to 6 players. A unique challenge to your daring and judgment! Can you throw a triple? If you XORKLE you've blown your turn! A BeeJay Funware original.

XORKLE II(*) - Play XORKLE on 2 home computers over the phone! Up to three players at each location.

(*) requires RS232 interface, modem & a fellow 99'er similarly equipped. Each player must have a copy of the program (order two). All programs require Extended Basic. Multiple programs furnished on same tape or disk.

***** Prices *****
1 PROGRAM...\$12.95 2 PROGRAMS...\$16.95
4 PROGRAMS \$21.95 PLEASE ADD \$1.50 SHIPPING
Colorado residents please add 6.5% sales tax.

BeeJay FUNWARE

P.O. Box 27643

Denver, CO 80227 303-979-6193

SATISFACTION GUARANTEED

COMPUTER / BASF CASSETTES / -DPS

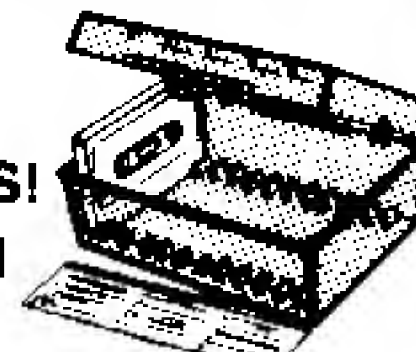


THE WORLD'S FINEST

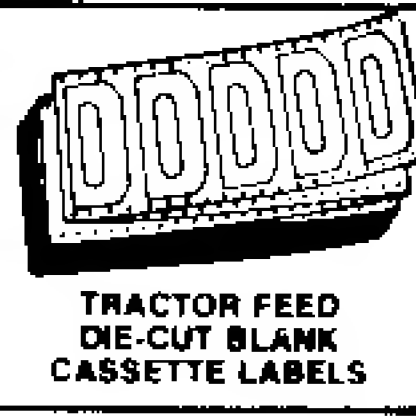
- Data media for all microcomputers
- Used nationwide by software manufacturers, hobbyists, schools and businesses
- Premium 5-screw shell with leader fits all standard recorders

CASSETTE STORAGE CADDY

NEW!
ORGANIZE YOUR TAPES!
\$2.95 EACH



**FINEST QUALITY
PHILIPS (MORECO)
TYPE HARD BOXES**



**TRACTOR FEED
DIE-CUT BLANK
CASSETTE LABELS**

GET ONE CADDY FREE! Buy 2 doz. Cassettes & One Caddy. Get One Caddy FREE!
OFFER EXPIRES AUGUST 1, 1993

• SATISFACTION GUARANTEED OR YOUR MONEY BACK •
FOR IMMEDIATE SHIPMENT
USE YOUR VISA OR MASTERCARD **CALL 213/710-1430**

ORDER FORM

ORDER NOW... MAIL TO: YORK 10™ Computerware

24573 Kittredge St., #99, Canoga Park, CA 91307

ITEM	1 DOZEN	2 DOZEN	TOTAL
C 05	7.50	13.50	
C 10	8.00	14.40	
C 20	10.00	18.00	
Hard Box	2.50	4.00	
Storage Caddy \$2.95 ea. Quantity			
Blank labels 4.00/100 30.00/1000			
			SUB TOTAL
Calif. residents add 6% sales tax			
Shipping/handling 1 doz \$2.20 2 doz \$1.50			
3 doz \$4.50 each additional doz \$1.50			
For Parcel Post instead of UPS ADD \$1			
Outside Continental USA ADD \$2			
			TOTAL

Each cassette includes two YORK 10 labels only. Boxes are sold separately. Shipments are by U.P.S. unless Parcel Post requested. Boxes, caddies, and blank labels are free of shipping charges when ordered with cassettes. When ordered without cassettes, shipping charges. Boxes—\$1.00 doz., Caddies—\$1.00 each. MINIMUM SHIPPING/HANDLING ON ANY ORDER—\$2.00

Check or M.O. Charge to Credit Card enclosed VISA MASTERCARD
PLEASE SEND QUANTITY DISCOUNTS

Name _____
Address _____
City _____ State/Zip _____
Card No. _____ Exp. _____
Signature _____

Pewterware

PRESENTS

MATCH WITS

◆ + ● ◆ + ●
THIS IS A GAME OF
CONCENTRATION FOR 1 TO 4
PLAYERS. TAKE TURNS TRYING
TO MATCH PAIRS OF COLORED
PICTURES. EVERY ONE YOU
MATCH IS ONE POINT AND EVERY
ONE OF YOUR OPPONENTS THAT YOU
MATCH IS WORTH DOUBLE.

MATCH WITS (BASIC/CASSETTE).....\$10

OTHER GAMES AVAILABLE: FROM:
BLUEGRASS SWEEPSTAKES (BASIC) \$10 PEWTERWARE
CHALLENGE POKER (BASIC) \$10 POST OFFICE BOX 503
DECATHLON (BASIC) \$10 GULF BREEZE, FL 32561
UP PERISCOPE (EXTENDED BASIC) \$15 DEALER INQUIRIES INVITED

**MANUFACTURER'S REPRESENTATIVES
NEEDED TO MARKET HIGH QUALITY PEWTERWARE
SOFTWARE PROGRAMS FOR THE TEXAS INSTRUMENTS
TI-99/4(A). ESTABLISHED EXPERIENCE WITH COMPUTER
OUTLETS DESIRED. ALL FOUR U.S. REGIONS AVAILABLE.**

SEND RESUME TO:

MR. TOM KROHN

PEWTERWARE COMPUTER SOFTWARE

POST OFFICE BOX 503

GULF BREEZE, FL 32561

Come Work & Play In A Unique Environment...

Follow the Oregon Trail
to the Beautiful Willamette Valley

*Join a Dynamic Team
of Creative Individuals
Who Thrive on Challenge
and Cherish Their
Quality of Life.*

We are offering—

- Technical Writers/Editors
 - Software Engineers
 - Logic Designers
 - Applications Programmers
 - Advertising & Marketing Professionals
- The Opportunity of a Lifetime**

Send your resume in strictest confidence to:

99'er Talent Hunt
Emerald Valley Publishing Co.
1500 Valley River Drive, Suite 250
Eugene, Oregon 97401



TEXAS INSTRUMENTS HOME COMPUTER

Retail price \$225. Your special BACH Company price is a low **\$149.95. Less TI \$50 REBATE - \$99.95!** Order today **TOLL FREE 800-227-8292**. In California call 415-969-6600.

TI Home Computer	includes rebate! 99.95
Peripheral Expansion System	182.95
RS-232 Card	134.95
Disk Controller Card	192.95
Expansion System Disk Drive	297.95
Maxell MD1 Single Side 5-1/4" Floppy Disk (10)	29.10
Memory Expansion Card	228.95
P-Code Card	189.95
Pascal Development System	370.50
Solid State Speech Synthesizer	108.95
Telephone Coupler	158.95
TI-Impact Printer	559.00
10" Color Monitor	319.95

**TOLL FREE
800-227-8292**

CALL FOR
FREE TI
SOFTWARE
LIST!



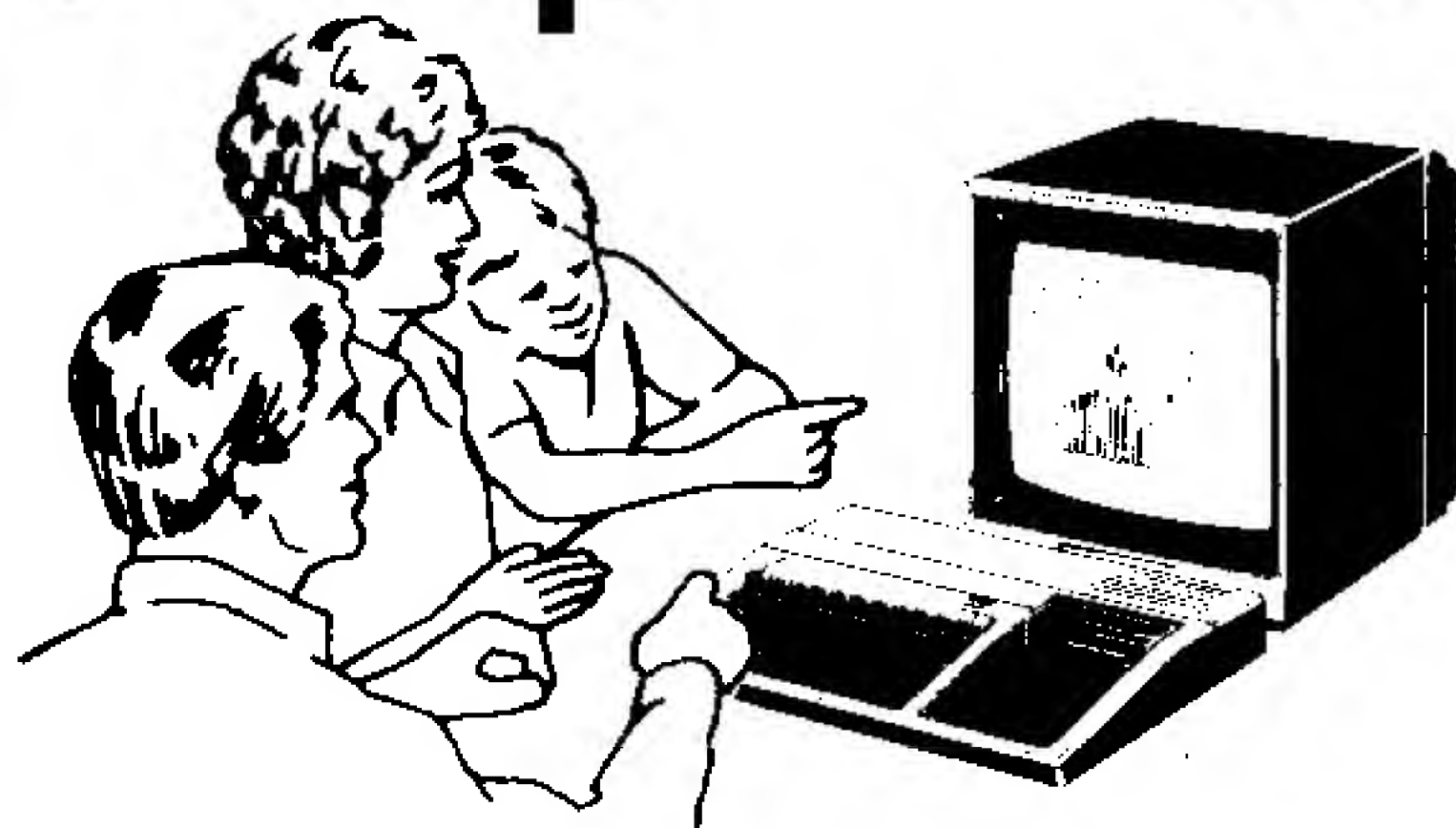
99/4A

The BACH Company
715 ENSIGN WAY, PALO ALTO, CA 94303

99'er BUYERS GUIDE™

A Bound-In Supplement for Subscribers
of 99'er Home Computer Magazine

Computer Dealers Wanted



For the Most Wanted Home
and Small Business
Computers
Texas Instruments 99/4A
Computers from Keystone
Distributing Company

Dealing with Keystone is like Dealing Direct!*

Keystone Distributing, one of the largest distributors of Texas Instruments products has a complete inventory of TI computers, software, peripherals, calculators, and educational products ready for shipment immediately!

Texas Instruments 99/4A computer gives an unmatched combination of features including more languages than any other computer on the market in its price category.

If you are now paying more for other computers, software, peripherals, calculators, and educational products, but are making less—go for the best! Texas Instruments computer products distributed by Keystone Distributing Company of Norwood, Mass.

"GO FOR IT!" Call or Write:

KEYSTONE DISTRIBUTING

51 Morgan Drive
Norwood, Massachusetts 02062
Call: 1-617-769-3225 or outside Massachusetts 800-343-9030

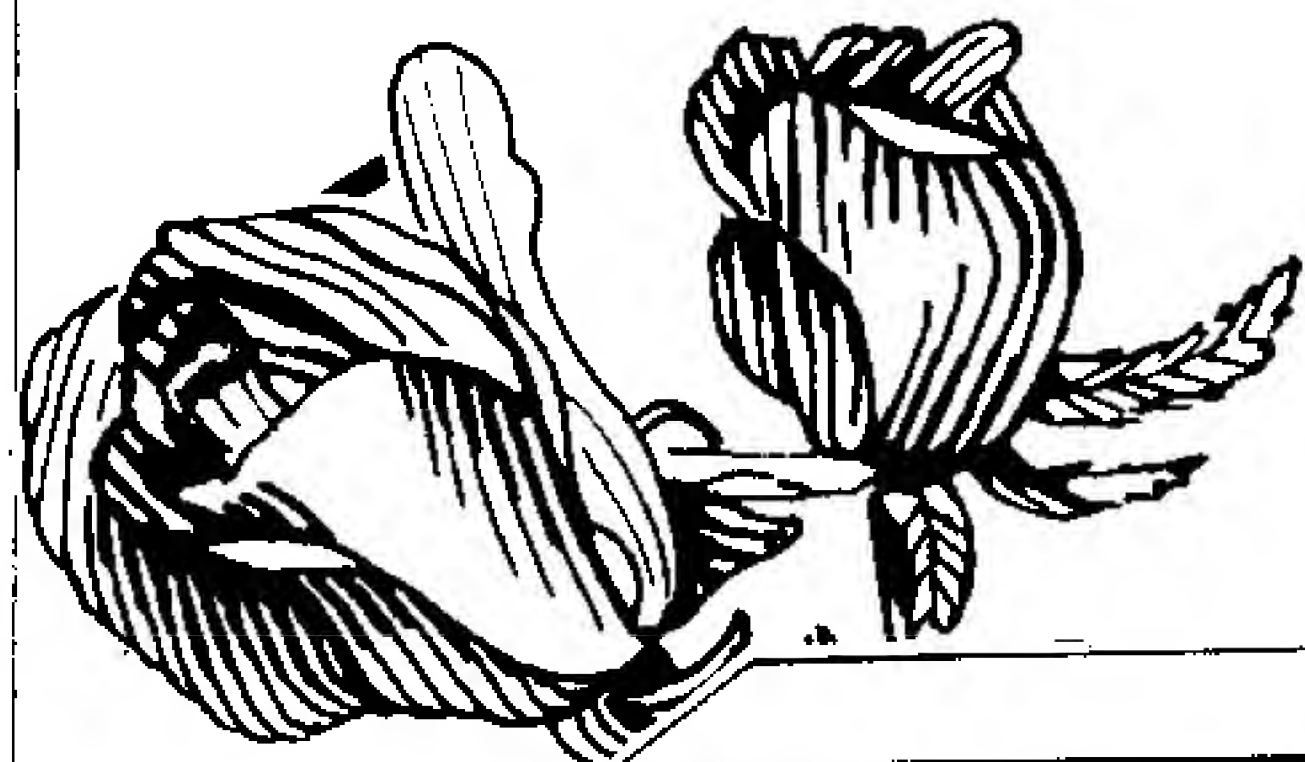
*We sell wholesale only to qualified dealers.
F.O.B. Norwood, Mass. Please have your tax number ready when calling.



TEXAS INSTRUMENTS
INCORPORATED



Texas Instruments Home Computer



MODULES MOTHERS LOVE

Dhein's carries everything
Texas Instruments
makes for the TI-99/4A —
and lots of 3rd party
software as well —
all at everyday
low prices.

PHM3007	Household Budget Management	\$29.95
PHM3013	Personal Record Keeping	37.95
PHM3012	Security Analysis	29.95
PHM3111	TI Writer	73.95
PHM3005	Video Graphs	15.95
PHM3020	Music Maker	29.95
PHM3010	Physical Fitness	21.95
PHM3021	Weight Control and Nutrition	29.95
PHM3064	Touch Typing Tutor	29.95
PHM3109	TI LOGO II	69.95

----- COUPON -- MAIL TODAY --

FREE

Subscription to the **COMPUTER BULLETIN**
for the rest of 1983.

Name _____

Street _____ State _____

City _____ Zip _____

Would you like to have our complete
catalog? Send in the coupon or drop us
a post card **TODAY**.

- Programs you can type in yourself
- Feature articles on the 99/4 world
- Descriptive price list

ONLY \$2.98 shipping and handling any size order any place in the continental U.S.A.
No extra charge for Visa or Master Card. Iowa residents add 4% sales tax.

The best combination of Price, Service and Quality is **TRUE VALUE**.
More than just a name, it is our way of doing business.

DHEIN'S



(319) 236-3861

7 W. Airline Hwy.
Waterloo, IA 50701

TI-99/4A Home Computer System

TI-99/4A Keyboard **CALL**

TEXAS INSTRUMENTS

Model	Name	Mr. Sugg. Ret.	Elek-Tek Price	Model	Name	Mr. Sugg. Ret.	Elek-Tek Price	Model	Name	Mr. Sugg. Ret.	Elek-Tek Price
CONSOLE											
PHC 004A	TI-99/4A Home Computer (incl. RF Modulator) (Less \$100 Rebate From Texas Instruments)	450.00	CALL	Addison-Wesley Computer Math Games (Developed by Addison-Wesley Publishing Co.)				PHD 5015	Oldies But Goodies—Games I	19.95	16.00
PERIPHERALS				PHM 3083	Computer Math Games II	39.95	32.00	PHD 5017	Oldies But Goodies—Games II	24.95	20.00
PHP 1200	Peripheral Expansion Box	249.95	180.00	PHM 3088	Computer Math Games VI	39.95	32.00	PHD 5025	Saturday Night Bingo (Solid State Speech™ Synthesizer is required)	29.95	24.00
PHP 1220	RS-232 Card	174.95	130.00	Milliken Home Math Series—K thru 8th grade (Developed by Milliken Publishing Co.)				PHD 5037	Draw Poker (Extended BASIC Command Modules is required)	24.95	20.00
PHP 1240	Disk Controller Card (One Disk Manager module packed with each Disk Controller)	249.95	180.00	PHM 3090	Addition	39.95	32.00	PHD 5057	Tombstone City: 21st Century (32K Memory Expansion and Extended BASIC Command Module are required)	19.95	16.00
PHP 1250	External System Disk Drive (Disk Drive Controller required)	399.95	285.00	PHM 3091	Subtraction	39.95	32.00	PHD 5058	TI Invaders (32K Memory Expansion and Either Extended BASIC or Editor/Assembler Command Module are required)	19.95	16.00
PHP 1260	Memory Expansion Card (32K RAM)	299.95	215.00	PHM 3092	Multiplication	39.95	32.00	PHD 5060	Munch Man (32K Memory Expansion and Either Extended BASIC or Editor/Assembler Command Module are required)	19.95	16.00
PHP 1270	P-Code Card (32K RAM Memory Expansion required)	249.95	180.00	PHM 3093	Division	39.95	32.00				
PHP 1500	Solid State Speech™ Synthesizer	149.95	110.00	PHM 3094	Integers	39.95	32.00				
PHP 1850	Disk Memory Drive (External)	499.95	350.00	PHM 3095	Fractions	39.95	32.00				
PHP 2500	TI 80 Column Impact Printer	750.00	500.00	PHM 3096	Decimals	39.95	32.00				
PHA 4100	10" Color Monitor	399.95	320.00	PHM 3097	Percents	39.95	32.00				
OPTIONAL ACCESSORIES				PHM 3098	Number Readiness	39.95	32.00				
PHP 1100	Wired Remote Controllers (Pair)	34.95	28.00	PHM 3099	Laws of Arithmetic	39.95	32.00				
PHA 1950	Thermal Paper (2 Pack)	9.95	8.00	PHM 3100	Equations	39.95	32.00				
PHA 2000	Cassette Cable	14.95	12.00	PHM 3101	Measurement Formulas	39.95	32.00				
PHA 2010	Monitor Cable	19.95	15.00	Texas Instruments Packages							
APPLICATION PROGRAMS				PHD 5007	Teach Yourself BASIC	34.95	28.00	PHM 5045	Adventureland	29.95	24.00
Home Management/Personal Finance Command Modules				PHD 5009	Music Skills Trainer	29.95	24.00	PHD 5047	Mission Impossible	29.95	24.00
PHM 3006	Home Financial Decisions	29.95	24.00	PHD 5011	Computer Music Box	19.95	16.00	PHD 5048	VooDoo Castle	29.95	24.00
PHM 3007	Household Budget Management (Data storage system is required)	39.95	32.00	PHD 5018	Market Simulation	19.95	16.00	PHD 5049	The Count	29.95	24.00
PHM 3012	Securities Analysis	54.95	32.00	PHD 5019	Teach Yourself Extended BASIC (Extended BASIC Command Module is required)	24.95	20.00	PHD 5050	Strange Odyssey	29.95	24.00
PHM 3013	Personal Record Keeping (Data storage system is recommended)	49.95	40.00	PHD 5020	Music Maker Demonstration (Music Maker Command Module is required)	14.95	12.00	PHD 5051	Mystery Fun House	29.95	24.00
PHM 3016	Tax/Investment Record Keeping (Disk system is recommended)	69.95	56.00	PHD 5023	Basketball Statistics (Extended BASIC Command Module is required)	24.95	20.00	PHD 5052	Pyramid of Doom	29.95	24.00
PHM 3022	Personal Real Estate (Data storage system is recommended)	69.95	56.00	PHD 5026	Bridge Bidding	29.95	24.00	PHD 5053	Ghost Town	29.95	24.00
PHM 3044	Personal Report Generator (Data storage system is recommended)	49.95	32.00	PHD 5030	Speak & Spell™ Program (Solid State Speech™ Synthesizer is required)	29.95	24.00	PHD 5054	Savage Island I & II	39.95	32.00
PHM 3111	TI Writer (32K Memory Expansion required)	99.95	75.00	PHD 5031	Speak & Math™ Program (Solid State Speech™ Synthesizer and Terminal Emulator II are required)	29.95	24.00	PHD 5056	Golden Voyage	29.95	24.00
PHM 3113	MicroSoft™ Multiplan™ (32K Memory Expansion required)	99.95	75.00	PHD 5039	Bridge Bidding I	29.95	24.00	Texas Instruments Packages			
Diskette Packages (Developed by Minnesota Educational Computing Consortium)				PHD 5041	Bridge Bidding III	29.95	24.00	PHT 6010	Mystery Melody	9.95	9.00
PHD 5001	Mailmg List	69.95	56.00	PHD 5042	Speller Writer (Terminal Emulator II Command Module and Solid State Speech™ Synthesizer are required)	29.95	24.00	PHT 6015	Oldies But Goodies—Games I	14.95	9.00
PHD 5003	Personal Financial Aids	19.95	16.00	PHD 5067	Beginner's BASIC Tutor	29.95	24.00	PHT 6017	Oldies But Goodies—Games II	19.95	9.00
PHD 5021	Checkbook Manager	19.95	16.00	PHD 5078	Metric and Counting* (Extended Basic Command Module is required)	29.95	24.00	PHT 6025	Saturday Night Bingo (Solid State Speech™ Synthesizer is required)	24.95	9.00
PHD 5022	Business Aids Library—Finance Management (Extended BASIC Command Module is required)	39.95	32.00	PHD 5079	Elementary Economics	29.95	24.00	PHT 6037	Draw Poker	19.95	9.00
PHD 5024	Business Aids Library—Inventory Management (Personal Record Keeping or Statistics Command Module is required)	69.95	56.00	PHD 5080	Elementary Math and Science* (Extended BASIC Command Module is required)	29.95	24.00	Adventure International Adventure Series (Developed by Scott Adams) (PHM 3041D required)			
PHD 5027	Business Aids Library—Invoice Management (Personal Record Keeping or Statistics Command Module is required)	69.95	56.00	PHD 5081	Astronomy* (Extended BASIC Command Module is required)	29.95	24.00	PHM 6045	Adventureland	29.95	24.00
PHD 5029	Business Aids Library—Cash Management (Extended BASIC Command Module is required)	69.95	56.00	PHD 5082	Word Beginnings* (Extended BASIC Command Module is required)	29.95	24.00	PHM 6047	Mission Impossible	29.95	24.00
PHD 5038	Business Aids Library—Lease/Purchase Decisions	69.95	56.00	PHD 5083	Exploring* (Extended BASIC Command Module is required)	29.95	24.00	PHM 6048	Voodoo Castle	29.95	24.00
PHT 6003	Personal Financial Aids	14.95	12.00	PHD 5084	Math Practice* (Extended BASIC Command Module is required)	29.95	24.00	PHT 6049	The Count	29.95	24.00
PHT 6038	Business Aids Library—Lease/Purchase Decisions	59.95	45.00	APPLICATION PROGRAMS CONTINUED				PHM 6051	Strange Odyssey	29.95	24.00
Documentation Section for Young Minds				PHD 5085	Education/Personal Enrichment Continued			PHM 6052	Mystery Fun House	29.95	24.00
PHA 2606	Creative Programming Computer Competency Series—Volume I	9.95	8.00	PHD 5086	Natural Science* (Extended BASIC Command Module is required)	29.95	24.00	PHM 6053	Pyramid of Doom	29.95	24.00
PHA 2607	Creative Programming Computer Competency Series—Volume II	9.95	8.00	PHD 5087	Social Science* (Extended BASIC Command Module is required)	29.95	24.00	PHM 6054	Ghost Town	29.95	24.00
PHA 2608	Creative Programming Computer Competency Series—Volume III	9.95	8.00	PHD 5088	Teacher's Tool Box* (Extended BASIC Command Module and printer are required)	29.95	24.00	PHM 6056	Savage Island I & II	39.95	32.00
PHA 2609	Creative Programming Computer Competency Series—Allstar Projects	9.95	8.00	Entertainment				PHM 6058	Golden Voyage	29.95	24.00
Educational/Personal Enrichment Command Modules				PHT 6007	Teach Yourself BASIC	29.95	24.00	OTHER APPLICATION PROGRAMS			
OLM Academics				PHT 6009	Music Skills Trainer	24.95	9.00	PHM 3001	Demonstration	69.95	58.00
PHM 3114	Alligator Mixttttt	39.95	32.00	PHT 6011	Computer Music Box	14.95	9.00	PHM 3011	Speech Editor (Solid State Speech™ Synthesizer is required)	44.95	32.00
PHM 3116	Demolition Division	39.95	32.00	PHT 6018	Market Simulation	14.95	12.00	PHM 3014	Statistics (Data storage system is recommended)	44.95	32.00
PHM 3118	Minus Missionttttt	39.95	32.00	PHT 6019	Teach Yourself Extended BASIC (Extended BASIC Command Module is required)	19.95	16.00	PHM 3026	Extended BASIC	99.95	75.00
Texas Instruments Packages				PHT 6026	Bridge Bidding I	24.95	12.00	PHM 3035	Terminal Emulator II	49.95	40.00
PHM 3002	Early Learning Fun	29.95	24.00	PHT 6031	Speak & Math™ Program (Solid State Speech™ Synthesizer and Terminal Emulator II are required)	24.95	12.00	PHM 3055	Editor/Assembler	99.95	40.00
PHM 3003	Beginning Grammar	29.95	24.00	PHT 6039	Bridge Bidding II	24.95	12.00	PHM 3058	Mini Memory (4K)	99.95	80.00
PHM 3004	Number Magic	19.95	16.00	PHT 6041	Bridge Bidding III	24.95	12.00	PHM 3045D	SMU Electrical Engineering Library** (2 Diskettes included)	149.95	120.00
PHM 3005	Video Graphs	19.95	16.00	PHT 6042	Speller Writer (Terminal Emulator II Command Module and Solid State Speech™ Synthesizer are required)	24.95	12.00	PHM 3045T	SMU Electrical Engineering Library** (16 Cassettes included)	149.95	120.00
PHM 3008	Video Chess	69.95	56.00	PHT 6067	Beginner's BASIC Tutor	24.95	20.00	PHD 5004	Programming Aids I	14.95	12.00
PHM 3010	Physical Fitness	29.95	24.00	Command Modules				PHD 5005	Programming Aids II	24.95	20.00
PHM 3020	Music Maker (Data storage system is recommended)	39.95	32.00	PHM 3009	Football	29.95	24.00	PHD 5006	Math Routine Library	29.95	24.00
PHM 3021	Weight Control and Nutrition (Data storage system is recommended)	59.95	32.00	PHM 3018	Video Games I	29.95	24.00	PHD 5008	Electrical Engineering Library	29.95	24.00
PHM 3040	TI LOGO (Memory Expansion is required)	129.95	75.00	PHM 3023	Hunt the Wumpus	24.95	20.00	PHD 5012	Programming Aids III	19.95	16.00
PHM 3084	Touch Typing Tutor* (Available for TI-99/4A only)	39.95	32.00	PHM 3024	Indoor Soccer	29.95	24.00	PHD 5013	Graphing Package	19.95	16.00
PHM 3109	TI Logo II* (32K Memory Expansion is required)	129.95	75.00	PHM 3025	Mind Changers	24.95	20.00	PHD 5016	Structural Engineering Library	29.95	24.00
Scott, Foresman Reading and Math Packages (Developed by Scott, Foresman)				PHM 3030	A-Maze-ing	24.95	20.00	PHD 5044	AC Circuit Analysis	29.95	24.00
PHM 3015	Early Reading (Solid State Speech™ Synthesizer is required)	54.95	44.00	PHM 3052	Tombstone City 21st Century	39.95	32.00	PHD 5063	UCSD-PASCAL: Compiler (32K Memory Expansion and P-Code required)	124.95	100.00
PHM 3043	Reading Fun (Solid State Speech™ Synthesizer is recommended)	54.95	44.00	PHM 3053	TI Invaders	39.95	32.00	PHD 5064	UCSD p-System: Assembler/Linker (32K Memory Expansion and P-code required)	99.95	80.00
PHM 3046	Reading On	54.95	44.00	PHM 3054	Car Wars	39.95	32.00	PHD 5065	UCSD p-System: Editor/Flair/Utilities (32K Memory Expansion and P-code required)	74.95	60.00
PHM 3047	Reading Roundup	54.95	44.00	PHM 3057	Munch Man	39.95	32.00	PHD 5066	TI PILOT (32K Memory Expansion and P-code required)	79.95	60.00
PHM 3048	Reading Rally	54.95	44.00	PHM 3042D	Tunnels of Doom (2 Diskette Games Included)	59.95	45.00	PHD 5068	Course Designer Authoring Package (Extended BASIC required and Video Controller optional)	199.95	150.00
PHM 3082	Reading Flight	54.95	44.00	PHM 3042T	Tunnels of Doom (2 Cassette Games Included)	59.95	45.00	PHD 5075	Text-to-Speech (English) a (Solid State Speech™ Synthesizer, 32K Memory Expansion and Extended BASIC Command Module are required)	29.95	24.00
PHM 3027	Addition and Subtraction I (Solid State Speech™ Synthesizer is recommended)	39.95	32.00	PHM 3056	Alpiner	39.95	32.00	Cassette			
PHM 3028	Addition and Subtraction II (Solid State Speech™ Synthesizer is recommended)	39.95	32.00	PHM 3110	Chisholm Trail	39.95	32.00	PHT 6004	Programming Aids I	9.95	9.00
PHM 3029	Multiplication I (Solid State Speech™ Synthesizer is recommended)	39.95	32.00	PHM 3112	Parasc	39.95	32.00	PHT 6006	Math Routine Library	24.95	9.00
PHM 3049	Division I (Solid State Speech™ Synthesizer is recommended)	39.95	32.00	Milton Bradley Packages (Developed by Milton Bradley Company)				PHT 6008	Electrical Engineering Library	24.95	9.00
PHM 3050	Numerations I	39.95	32.00	PHM 3033	The Attacktt	39.95	32.00	PHT 6013	Graphing Package	14.95	9.00
PHM 3051	Numerations II	39.95	32.00	PHM 3032	Blastoff	24.95	20.00	PHT 6016	Structural Engineering Library	24.95	9.00
Scholastic Packages (Developed by Scholastic, Inc.)				PHM 3033	Blackjack and Pokerttt	24.95	20.00	PHL 7001	The Home Financial Manager	139.95	100.00
PHM 3059	Scholastic Spelling—Level 3 (Solid State Speech™ Synthesizer is required)	59.95	45.00	PHM 3034	Hustlett	24.95	20.00	PHL 7002	The Family Entertainer	89.95	65.00
PHM 3060	Scholastic Spelling—Level 4 (Solid State Speech™ Synthesizer is required)	59.95	45.00	PHM 3036	ZeroZaptt	19.95	16.00	PHL 7003	The Elementary Educator	99.95	75.00
PHM 3061	Scholastic Spelling—Level 5 (Solid State Speech™ Synthesizer is required)	59.95	45.00	PHM 3037	Hangmantt	19.95	16.00	PHL 7004	The Music Educator	64.90	40.00
PHM 3062	Scholastic Spelling—Level 6 (Solid State Speech™ Synthesizer is required)	59.95	45.00	PHM 3038	Connect Fourtt	19.95	16.00	PHL 7005	The Super Programmer	119.00	90.00
Texas Instruments Packages				PHM 3039	Yahtzeett	24.95	20.00	PHL 7006	The Speaking Math Teacher	113.85	90.00
PHD 5002	TI-Trek (with optional speech)	14.95	12.00	Adventure International Packages (Developed by Scott Adams)				PHL 7007	The Speaking Reading Teacher	109.90	85.00
PHD 5010	Mystery Melody	14.95	12.00	PHM 3041D	Adventure (Pirate Adventure Diskette Game Included)	49.95	32.00	PHL 7008	The Speaking Scholastic Spelling Teacher	219.80	180.00
				PHM 3041T	Adventure (Pirate Adventure Cassette Game Included)	49.95	32.00	PHL 7009	The TI Arcade Game Series	114.75	80.00
				PHM 3067	Otherott (Developed by Gabriel Industries)	39.95	32.00	PHL 7010	The Milton Bradley Game Series	114.75	80.00
				Gabriel Industries Packages (Developed by Gabriel Industries)				PHL 7011	The Computer Introductory Package	119.85	90.00
				Diskette Packages							
				PHD 5002	TI-Trek (with optional speech)	14.95	12.00				
				PHD 5010	Mystery Melody	14.95	12.00				

* Available In Second or Third Quarter, 1983
† Developed by Scott, Foresman
†† Developed by Milton Bradley—The Attack, Blasto, Hustle, ZeroZap,
Connect Four and Yahtzee are trademarks of Milton Bradley
††† Developed by Microsoft™, Inc. Multiplan™ is a trademark of Microsoft™, Inc.

†††† Developed by DLM, Inc.
 -†- Available only until replaced by peripheral card
 † UCSD, UCSD Pascal and UCSD p-System are all trademarks of the Regents of the University of California.
 -†- Othello is a trademark of Gabriel Industries.
 -†- Course is designed to be used with Circuit Analysis I textbook.



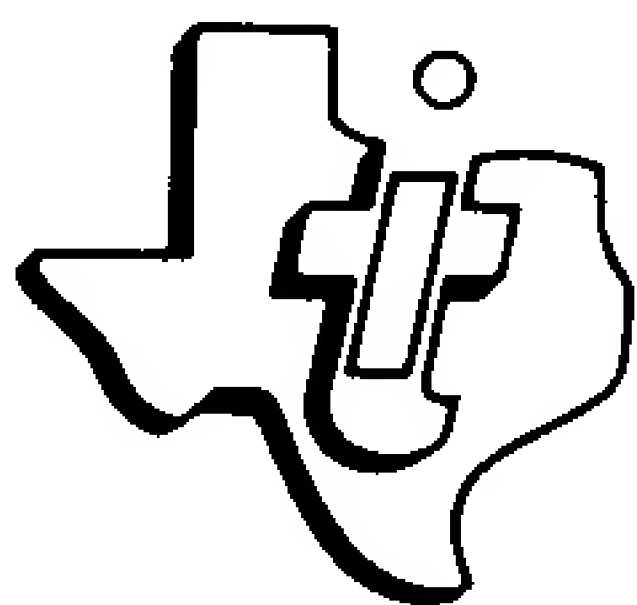
ELEK-TEK, inc.
6557 N. Lincoln Ave., Chicago, IL 60645
(800) 621-1269 (312) 677-7660

CALL TOLL FREE 800-621-1269 (EXCEPT IL, AK, HI) MasterCard or Visa by mail or phone. Mail Cashier's Ck., Mon. Ord., Pers. Ck. (2 wks to clr). Add \$4.00 1st item. (AK, HI, P.R., Canada add \$8.00 1st item except computers or large peripherals) \$1.00 ea. add'l shpg. & handl. Shipments to IL address add 6% tax. Prices subject to change. Write (no calls) for free catalog. 30 day return policy applies to defective merchandise ONLY. Sorry, no other exchanges or refunds since ALL MERCHANDISE SOLD BY ELEK-TEK IS BRAND NEW, FIRST QUALITY AND COMPLETE.

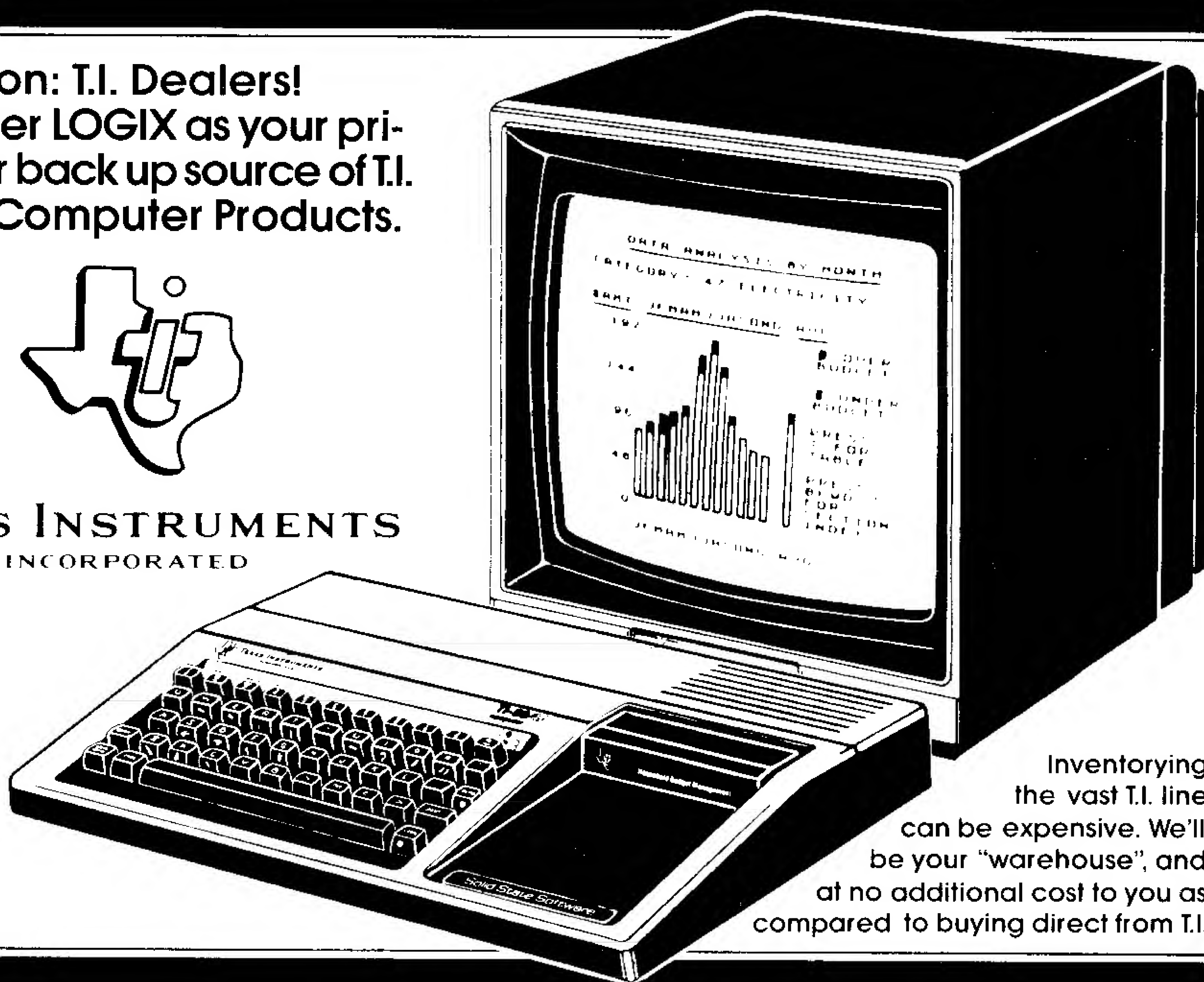
LOGIX

One of the largest full line distributors
of **Texas Instruments 99/4A Home Computer**
Hardware, Software, Peripherals and
other T.I. Products.

Attention: T.I. Dealers!
Consider LOGIX as your pri-
mary or back up source of T.I.
Home Computer Products.



TEXAS INSTRUMENTS
INCORPORATED



Inventorying
the vast T.I. line
can be expensive. We'll
be your "warehouse", and
at no additional cost to you as
compared to buying direct from T.I.

Call for information on availability and ordering. Please have resale Tax Number ready
when calling. Sorry. No retail sales—we sell wholesale only to qualified dealers.

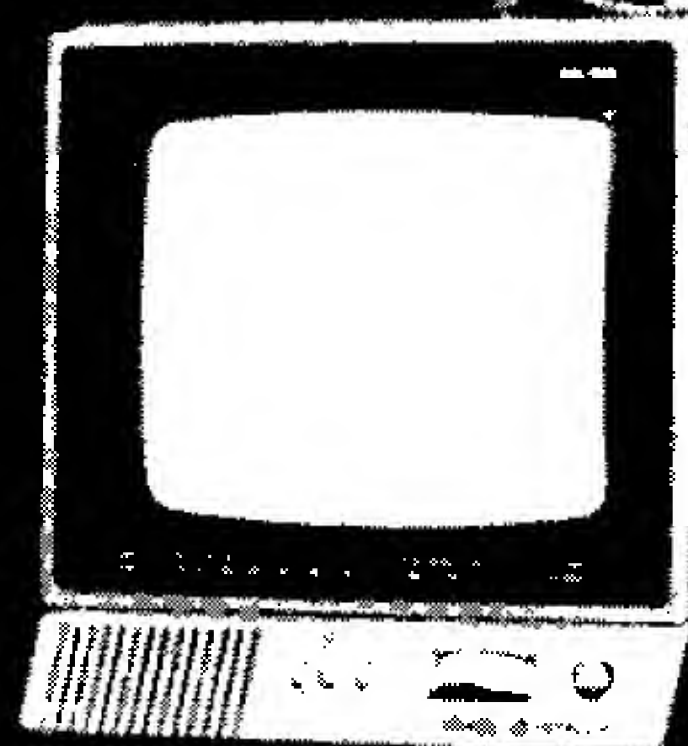
LOGIX

A Division of RTA Corp.

PO Box 4107, 991 Broadway, Albany, New York 12204 Call (518) 463-3251 Between 9 AM-5 PM EST
Telex 710 441-8299 OR In The States of VT, RI, PA, NJ, NH, CT, DE, and MA Call (800) 833-3420 Toll Free

IT'S FREE!!

"The EVERYTHING BOOK for TI Home Computers"



SEND FOR YOURS TODAY!

Lots of useful information on growing your 99/4A, 99/2, and CC-40 systems. All hardware, software programs, and accessories; how they work and what they do, and where to buy with confidence at major discount prices. All in **The EVERYTHING BOOK**—now it's free! Offering you premium service at discount prices.

- Over 500 quality programs for entertainment, education, business. **EVERYTHING for the TI system.**

Republic
Simulsoft
EduCAitor
Futura
Extended
Harvey
Headwind
Softcom

Linear Aesthetic
Maple Leaf Microware
Microcomputer Corp.
Micro Ed
Norton
Not Polyoptics
Oak Tree System
Program Design

Instant
Kuh
Fletcher Offshore
American Software
Dynamic Data
Pewterware
Prof. Microware

Tomputer
W.R. Wilson
Moonbeam
Hall
MECA
AND MORE!

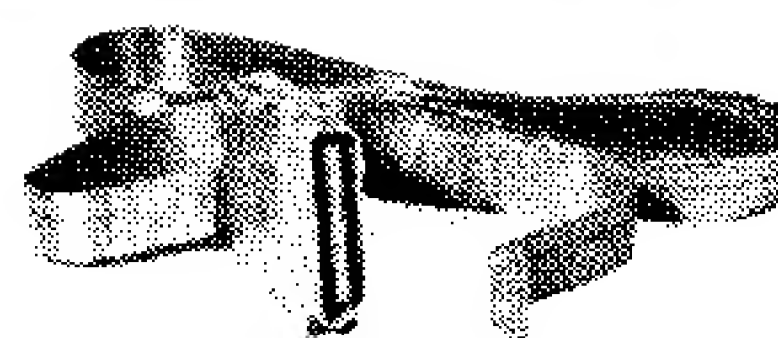
- Scores of hardware brands, including:

Wico joysticks
GE Data Cassette Recorder
Smith-Corona Printers
Okidata Printers
Epson Printers and Computers

Star Micronics Printers
Golden Star Color Monitors
Tandon Disk Drives
3M Data Disks and Cassettes
AND MORE!

- Many useful accessories:

Dust covers, Interface cables, Graphic design sheets, Quality furniture, Hard to find books, and much more!



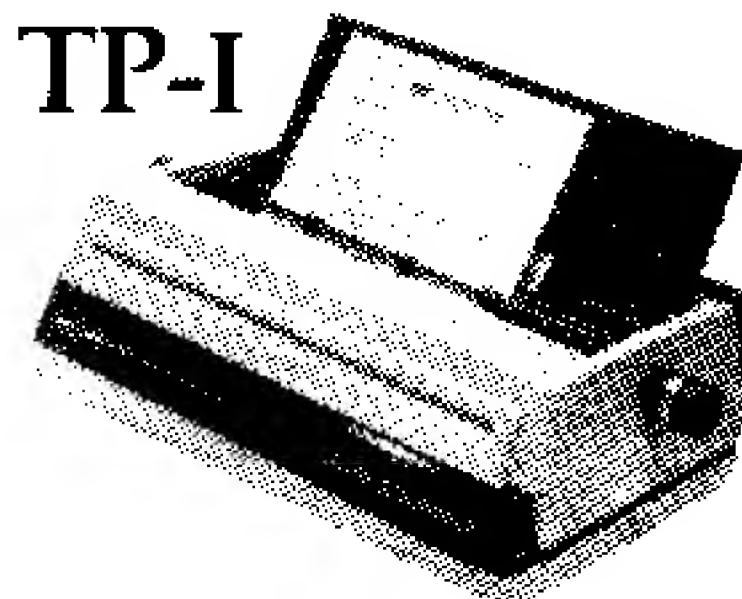
TI/CEN

Interface Cables that work for Okidata, TP-I, and most other printers.

New Solid State game modules from Funware!

SCM SMITH-CORONA

TP-I



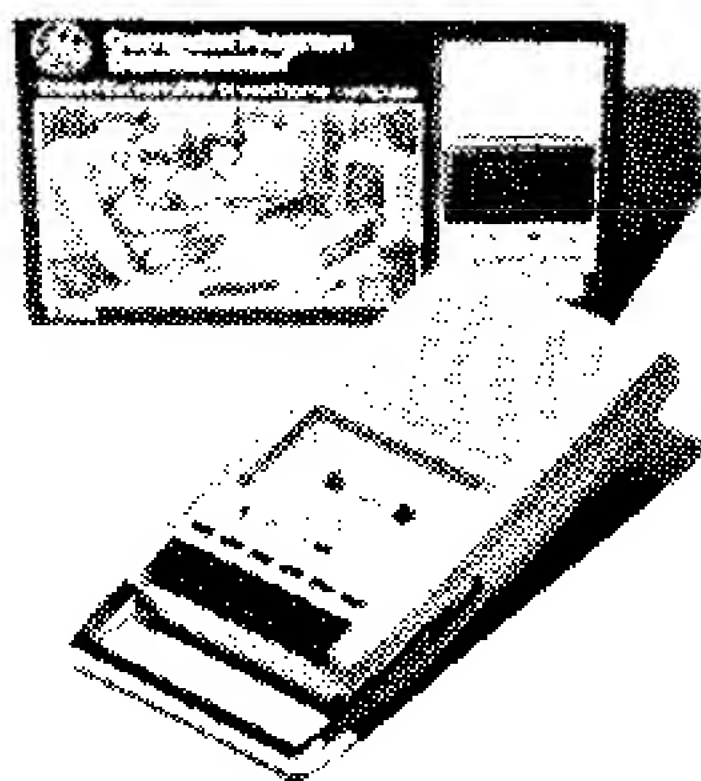
- LOW COST
- DAISY WHEEL PRINTER
- MICROPROCESSOR ELECTRONICS
- SERIAL OR PARALLEL INTERFACE
- SIMPLE, RELIABLE MECHANISM

Dealers -- Source from our unequalled selection. We manufacture and distribute many unique products for TI computers.

Software Authors --TENEX connects with the huge TI market! Let us make you successful! We produce and market.

TENEX

Computer Marketing Systems
P.O. Box 6578
South Bend, IN 46660
219/277-7726



GE Data Recorder

MAIL ME TODAY!!

You bet you can send me your free EVERYTHING BOOK!

NAME _____

ADDRESS _____

CITY/STATE/ZIP _____

PHONE () _____

Mail To: TENEX, Box 6578, South Bend, IN 46660





TEX-COMP™

TI USERS SUPPLY COMPANY
"YOUR LUBBOCK CONNECTION™"



TI-99/4 PRODUCTS AT PROFESSIONAL PRICES

ATTENTION TI-99/4 USERS: TEX-COMP HAS BEEN SUPPORTING THE ENTIRE 99/4 PRODUCT LINE TO PROFESSIONAL AND INDUSTRIAL ACCOUNTS, SINCE THE INTRODUCTION OF THE TI-99/4. NOW YOU CAN PURCHASE ALL YOUR TI-99/4 REQUIREMENTS FROM ONE SOURCE AT LOW "PROFESSIONALLY DISCOUNTED" PRICES ON THE ENTIRE 99/4 PRODUCT LINE. WE ARE A DIRECT TI NATIONAL ACCOUNT AND DEAL DIRECTLY WITH TI, ASSURING YOU THE BEST SERVICE, EARLIEST SHIPMENT AND LOWEST POSSIBLE PRICES.

**SEND FOR FREE ORDER KIT AND COMPLETE PRICE LIST
CONTAINS MONEY SAVING SPECIAL OFFERS AND NEW PRODUCT INFORMATION**

FREE SHIPPING ON SOFTWARE ORDERS OVER \$100. (PHD, PHM, PHT)

TI-99/4 PRODUCT LINE

Your Cost

CONSOLE	
PHC 004A	TI-99/4A Home Computer (less Modulator) \$139.95
PERIPHERALS	
PHP 1200	Color TV RF Modulator (14.95 with computer)
PHP 1220	Peripheral Expansion System 178.95
PHP 1240	RS-232 Card 125.95
PHP 1250	Disk Controller Card (One Disk Manager module packed with each Disk Controller) 178.95
PHP 1260	Expansion System Disk Drive (Disk Drive Controller required) 206.95
PHP 1270	Memory Expansion Card (32K RAM) 214.95
PHP 1280	P-Code Card (32K RAM Memory Expansion required) 178.95
	Psychic Development System — Includes P-Code Card (PHP 1270), UCSD Pascal Compiler (PHD 5063) and UCSD P-System Assembler Linker (PHD 5064) and UCSD P-System Editor/Editor Utilities (PHD 5065) (32K Memory Expansion Disk Drive and Controller are required) 357.95
PHP 1500	Solid State Speech™ Synthesizer 107.95

NEW	
PHP 1850	Cassette recorder & cable 59.95
PHP 2520	Disk Memory Drive (Disk Drive Controller required) 357.95
	TI Impact Printer 519.95

PHA 2100	R.F. Modulator (TV Adapter) 35.95
PHA 4100	19" Color Monitor 312.95
OPTIONAL ACCESSORIES	
PHP 1100	Wired Remote Controllers (Joysticks) (Pair) 25.95
PHA 2000	Dual Cassette Cable 10.95

APPLICATION PROGRAMS	
Home Management Personal Finance Command Modules	
PHM 3006	Home Financial Decisions 22.95
PHM 3007	Household Budget Management (Data storage system is recommended) 30.95
PHM 3012	Securities Analysis 41.95
PHM 3013	Personal Record Keeping (Data storage system is recommended) 38.95
PHM 3016	Tax Investment Record Keeping (Data storage system is recommended) 53.95
PHM 3022	Personal Real Estate (Data storage system is recommended) 53.95
PHM 3044	Personal Report Generator (Data storage system is recommended and PHM 3113 is recommended) 38.95
PHM 3113	TI Writer (32K Memory Expansion, RS-232 Printer, Disk Drive and Controller required. Available for TI-99/4A only) 74.95

PHM 3113	Microsoft™ Multiman (32K Memory Expansion Disk Drive and Controller required. RS-232 and Printer are recommended) 74.95
PHD 5001	Mailing List 53.95
PHD 5003	Personal Financial Aids 15.95
PHD 5021	Checkbook Manager 15.95
PHD 5077	Personal Tax Plan (Aardvark Software Inc. P-Code and 32K Memory Expansion are required. RS-232 and Printer are recommended) 74.95
PHT 6003	Personal Financial Aids 11.95
PHT 6038	Business Aids Library — Lease Purchase Decisions (Printer is recommended) 46.95

Education Personal Enrichment Command Modules	
PHM 3002	Early Learning Fun 22.95
PHM 3003	Beginning Grammar 22.95
PHM 3004	Number Magic 15.95
PHM 3005	Video Graphs 15.95
PHM 3008	Video Chess 53.95
PHM 3010	Physical Fitness 22.95
PHM 3020	Music Maker (Data Storage System is recommended) 30.95
PHM 3021	Weight Control and Nutrition (Data Storage System is recommended) 46.95

PHM 3064	Touch Typing Tutor (Available for TI-99/4A only. TI Logo II (32K Memory Expansion is required) 30.95
PHM 3109	TI Logo II (32K Memory Expansion is required) 69.95
PHM 3015	Early Reading (Solid State Speech Synthesizer is required) 41.95
PHM 3043	Reading Fun (Solid State Speech Synthesizer is recommended) 41.95
PHM 3046	Reading On 41.95
PHM 3047	Reading Roundup 41.95
PHM 3048	Reading Rally 41.95
PHM 3082	Reading Flight 41.95
PHM 3028	Addition and Subtraction I (Solid State Speech Synthesizer is recommended) 30.95
PHM 3029	Addition and Subtraction II (Solid State Speech Synthesizer is recommended) 30.95
PHM 3049	Multiplication I (Solid State Speech Synthesizer is recommended) 30.95
PHM 3049	Division I (Solid State Speech Synthesizer is recommended) 30.95

Entertainment Command Modules	
PHM 3009	Football 22.95
PHM 3018	Video Games I 22.95
PHM 3023	Hunt the Wumpus 14.95

PHM 3024	Indoor Soccer 22.95
PHM 3025	Mind Changers 19.95
PHM 3030	A-Maze-Ing 19.95
PHM 3052	Tombstone City 21st Century 30.95
PHM 3053	TI Invaders 30.95
PHM 3054	Car Wars 30.95
PHM 3057	Munch Man 30.95
PHM 3042D	Tunnels of Doom (2 Diskette Games Included) 43.95
PHM 3042T	Tunnels of Doom (2 Cassette Games Included) 43.95
PHM 3056	Alpiner 30.95
PHM 3110	Chisholm Trail 30.95
PHM 3112	Parsec 30.95
Milton Bradley Packages (Developed by Milton Bradley Company)	
PHM 3031	The Attack 30.95
PHM 3032	Blasio 19.95
PHM 3033	Blackjack and Poker I 19.95
PHM 3034	Hustle 19.95
PHM 3036	Zero Zap 15.95
PHM 3037	Hangman 15.95
PHM 3038	Connect Four 15.95
PHM 3039	Yantzee 19.95
Adventure International Packages (Developed by Scott Adams)	
PHM 3041D	Adventure (Pirate Adventure Diskette Game Included) 37.95
PHM 3041T	Adventure (Pirate Adventure Cassette Game Included) 37.95
Gabriel Industries Packages (Developed by Gabriel Industries)	
PHM 3067	Ohlolo (Developed by Gabriel Industries) 30.95

PHD 6046	OF PHD 5046	Adventureland 22.95
PHT 6047	OF PHD 5047	Mission Impossible 22.95
PHT 6048	OF PHD 5048	Voodoo Castle 22.95
PHT 6049	OF PHD 5049	The Count 22.95
PHT 6050	OF PHD 5050	Strange Odyssey 22.95
PHT 6051	OF PHD 5051	Mystery Fun House 22.95
PHT 6052	OF PHD 5052	Pyramid of Doom 22.95
PHT 6053	OF PHD 5053	Ghost Town 22.95
PHT 6054	OF PHD 5054	Savage Island I & II 30.95
PHT 6056	OF PHD 5056	Golden Voyage 22.95

PHM 6010	OF PHD 5046	Adventureland 22.95
PHM 6011	OF PHD 5047	Mission Impossible 22.95
PHM 6012	OF PHD 5048	Voodoo Castle 22.95
PHM 6013	OF PHD 5049	The Count 22.95
PHM 6014	OF PHD 5050	Strange Odyssey 22.95
PHM 6015	OF PHD 5051	Mystery Fun House 22.95
PHM 6016	OF PHD 5052	Pyramid of Doom 22.95
PHM 6017	OF PHD 5053	Ghost Town 22.95
PHM 6018	OF PHD 5054	Savage Island I & II 30.95
PHM 6019	OF PHD 5056	Golden Voyage 22.95

OTHER APPLICATION PROGRAMS Command Modules	
PHM 3011	Speech Editor (Solid State Speech Synthesizer is required) 35.95
PHM 3014	Statistics (Data storage system is recommended) 35.95
PHM 3026	Extended BASIC 74.95
PHM 3035	Terminal Emulator II 38.95
PHM 3055	Editor Assembler (Disk System and 32K RAM Memory Expansion required) 74.95
PHM 3058	Mini Memory 74.95

POSTPAID TI 99/4A ACCESSORIES FROM TEX-COMP



NEW — SIGNALMAN MARK III MODEM
FOR THE 99/4 and 99/4A—DIRECT CONNECT.
INTRODUCTORY OFFER—\$94.95 POSTPAID (Sug. list \$139.)
TEX-NET™ SPECIAL — TERMINAL EMULATOR II only \$34.95
When purchased with Mark III Modem.

Comes Complete with the Computer Interface Cable and Telephone Cord. Other Modems Require Separate \$20 \$30 Purchases.

OPTIONAL 9 V BATTERY ELIMINATOR \$10.95 POSTPAID

SPECIAL with purchase

FREE Source/Tex-Net sign on and hour use \$100. value



SPECIAL — 10

PREMIUM GRADE HUB-REINFORCED DISKETTES & FREE PLASTIC LIBRARY CASE

TI99/4A compatible

\$24.95 POSTPAID

Beanstalk™ Adventure
The ultimate adventure game based on the classic fairy tale. Jack and the Beanstalk. Now for the TI-99/4 and TI-99/4A.

Minimum Configuration required

1. 99/4 or 99/4A console
2. 1 Disk Drive and Controller
3. 32K Memory Expansion
4. Extended BASIC Module

\$17.95

including shipping and handling.
*Not available on cassette

SPECIAL — \$15.95 POSTPAID
JOYSTICK ADAPTER — Allows two Atari wired Joy Sticks to be used with 99/4 or 99/4A. \$10.95 with any WICO joystick

SPECIAL — \$15.95 POSTPAID
Head Cleaning Kit — Convenient and easy to use remove the debris contaminating drive heads!

SPECIAL — 8 DATA QUALITY C-11



Cassettes (BASF) in FREE Plastic storage case

TI99/4A compatible

\$9.95 POSTPAID

WICO COMMAND CONTROL JOY STICKS

IMPORTANT—Joy Sticks require TI adapter \$10.95 with Joy Stick.



Joy Stick 15-9714 \$26.95
Extra-long arcade-style bar handle grip that moves smoothly and easily into all 8 standard positions. Low-profile heavy-duty plastic base.



Famous Red Ball™ Joystick 15-9730 \$29.95
Arcade-style ball handle that moves smoothly and easily into all 8 standard positions. Low-profile heavy-duty plastic base.



The COMMAND CONTROL trackball \$57.95
Features injection-molded modular construction. Phenolic ball provides unique 360 degree movement to an infinite number of positions, can also be used to vary the speed of on-screen objects.



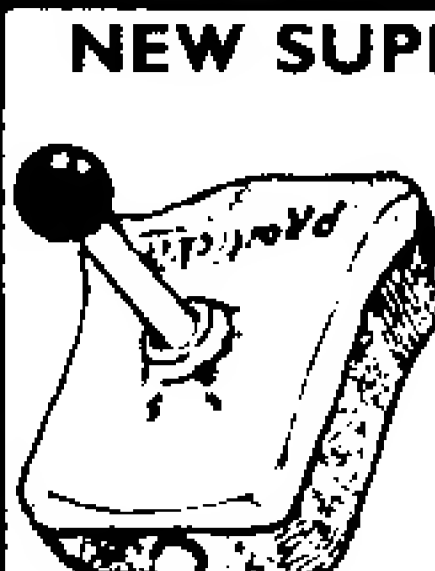
Quick-action fire button next to the ball for smooth, two-handed control.
Texas Instruments model 72-4980



Flip 'N' File TM For TI Modules and Cassettes \$27.95 POSTPAID



Flip 'N' File TM For 5 1/4" Mini Disks \$23.95 POSTPAID



NEW SUPER JOYSTICK II RATED #1
A commercial arcade joy stick adapted for use with your 99/4 or 99/4A. 2-way setting for Munchman and Parsec-a-Text-Comp exclusive.
\$34.95 postpaid WITH FREE 2 PORT ADAPTER 2nd unit only \$29.95

TERMS: All prices F.O.B. Los Angeles. For fastest service use cashiers check or money order. Personal checks take at least ten days to clear. Add 3% shipping and handling (\$3.00 minimum). East of Mississippi 4 1/2% (Free shipping on all software orders over \$100 and on postpaid specials). Add 6 1/2% S.T. for delivery in Calif. Prices and availability subject to change without notice. We reserve the right to limit quantities. This ad supersedes all previous ads.

Credit Cards add 3%



TEXAS INSTRUMENTS HOME COMPUTER

Retail price \$495. Your special BACH Company price is a low \$299.95. Less TI \$100 REBATE - \$199.95! Order today TOLL FREE 800-227-8292. In California call 415-969-6600.

TI Home Computer	299.95
Peripheral Expansion System	182.95
RS-232 Card	134.95
Disk Controller Card	192.95
Expansion System Disk Drive	297.95
Maxell MD1 Single Side 5-1/4" Floppy Disk (10)	29.10
Memory Expansion Card	228.95
P-Code Card	189.95
Pascal Development System	370.50
Solid State Speech Synthesizer	108.95
Telephone Coupler	158.95
TI-Impact Printer	559.00
10" Color Monitor	319.95

**TOLL FREE
800-227-8292**

**CALL FOR
FREE TI
SOFTWARE
LIST!**



The BACH Company
715 ENSIGN WAY, PALO ALTO, CA 94303

TI HOME COMPUTER ENCYCLOPEDIA/CATALOG from **UNISOURCE**

Includes descriptions of hundreds of programs, peripherals and accessories for your TI Home Computer from TI, from 3rd party authors and from many other sources. Only \$3 plus \$1.50 postage.

You'll find virtually everything you need for your Home Computer and you'll automatically get future updates. Order it today... from Unisource.

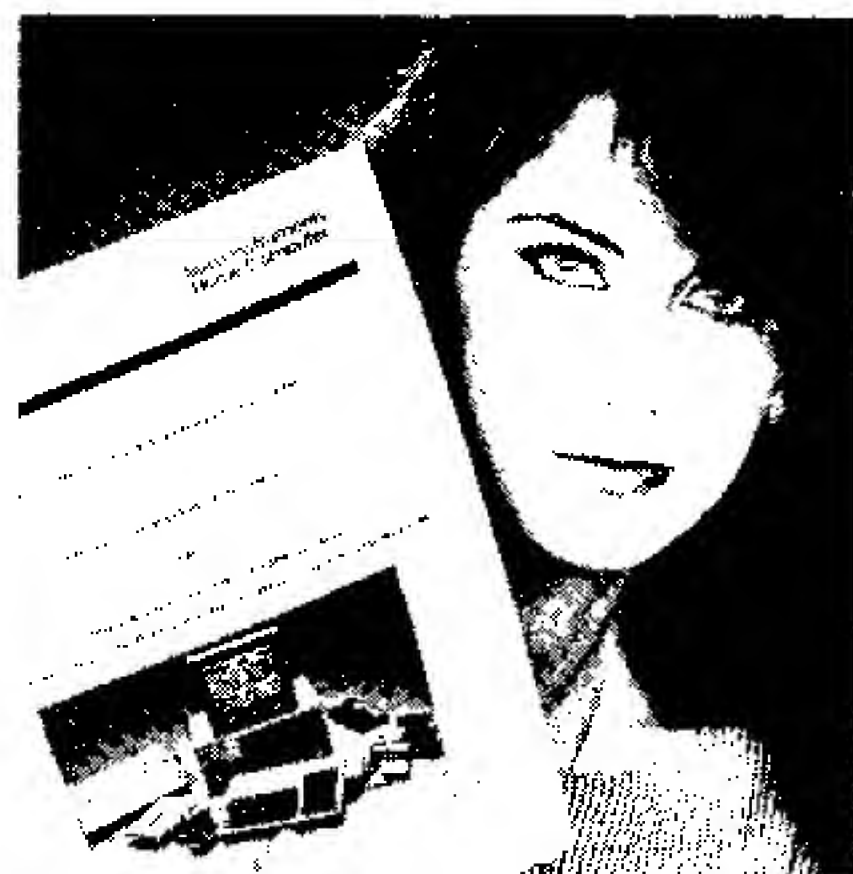
Toll Free 1-800-858-4580

(Ask for Operator 18)

(In Texas call 1-806-745-8834)

We accept Visa and MasterCard. For mail-in orders, send to P.O. Box 64240, Lubbock, TX 79464.

UNISOURCE ELECTRONICS, INC.



SAVE

SOUTHERN AUDIO VIDEO ELECTRONICS, INC.

1782 Marietta Blvd., N.W., Atlanta, Georgia 30318

Texas Instruments TI-99/4A Home Computer - \$159.00*

*With TI manufacturer's rebate of \$100.00



Texas Instruments 10" Color Monitor PHA 4100 - \$299.95.

Designed to handle the TI Home Computer's wide range of color, graphic and music capabilities with an extra sharp, clear picture and clean, clear sound.

PHP 1200 Peripheral Expansion System	\$179.95
PHP 1220 RS 232 Card	125.95
PHP 1240 Disk Controller Card	179.95
PHP 1250 Expansion System Disk Drive	287.95
PHP 1260 Memory Expansion Card (32K)	215.95
PHP 1270 P-Code Card	179.95
PHP 1280 Pascal Devel System	359.95
PHP 1500 Speech™ Synthesizer	107.95
PHP 1600 Telephone Coupler (Modem)	143.95
PHP 2500 TI Impact Printer	540.00
PHP 1100 Wired Remote Controllers	24.95
PHP 2700 Program Recorder	49.95
(Includes PHA 2622)	

**We carry in stock all
hardware and software for
TI home computers.**

PHM 3026 Extended Basic	\$71.95
PHM 3035 Terminal Emulator II	35.95
PHM 3058 Mini-Memory	71.95
PHM 3055 Editor/Assembler	35.95
PHM 3109 TI Logo II	71.95
PHM 3113 Microsoft Multiplan	71.95
PHM 3111 TI Writer	71.95
PHM 3112 Persec	28.95
PHM 3053 TI Invaders	28.95
PHM 3042T Tunnels of Doom	42.95
PHM 3041T Adventure (Pirate Adv.)	28.95
PHM 3057 Munch Man	28.95
PHM 3006 Home Financial Decisions	21.95
PHM 3044 Personal Report Generator	28.95
PHM 3002 Early Learning Fun	21.95
PHM 3090-97 Miliken Home Math Series K-8th grade	28.95
PHM 3059-62 Scholastic Spelling Level 3-6	39.95
PHM 3046-48 Scott, Foresman, Reading Pkgs	39.95
PHM 3064 Touch Typing Tutor	28.95
PHL 7008 Speaking Scholastic Spelling	157.95
PHM 3122 Plato Interpreter	35.95
PHM 5201-5308 Plato Courseware Series	35.95
PHM 3083-88 Addison Wesley Computer Math Games (I-VI)	28.95

Get the best prices on TI hardware and software. For a complete listing of all SAVE's products, send \$5.00 for our catalogue (refundable with your first order).

Enjoy the convenience of in-home shopping. Call our toll free number today.

Use your American Express, VISA, Mastercard, check or money order. Minimum order of \$50. Shipping and handling charges are extra. All prices are subject to change without notice. Allow 2-4 weeks for delivery. Prices good through May 15, 1983. *100.00 TI Rebate expires April 15, 1983.

**Order Toll Free 1-800-241-2682
In Georgia (404)-351-8459**



CANADIANS!

Prices too low to publish!

Write for our price list
of TI 99/2, TI-99/4A, CC-40
products at some of
the **BEST PRICES**
in CANADA

Check our large ad
in alternate issues

*No provincial sales tax
Mail order only
Shipped first class mail
for fast delivery*

Canadian Micro Works
Box 6221 Station C, Edmonton, Alberta
Canada T5B 4K6
403-461-0074

DUST COVERS

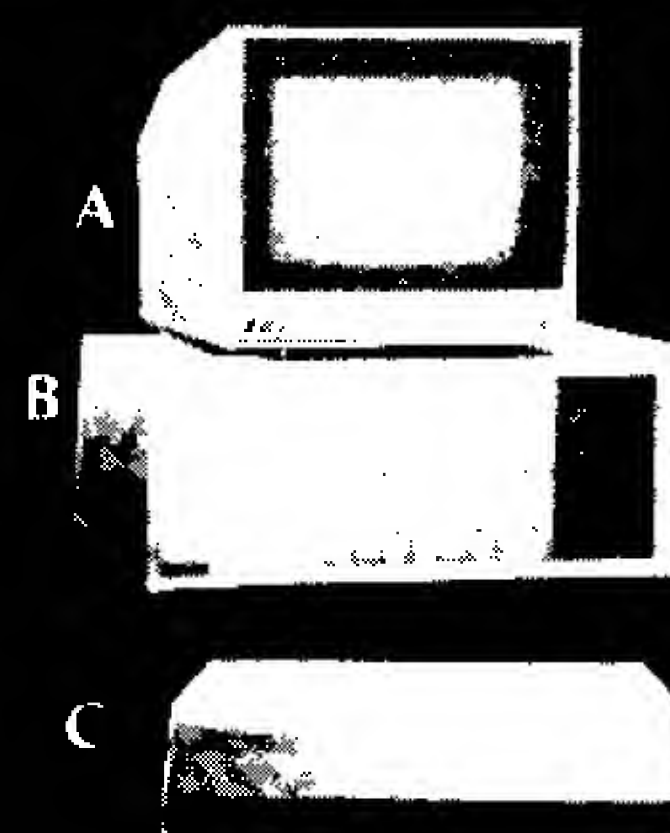
Features:

- Equipment Protection
- Handsome Appearance
- Custom-Fit
- Antistatic Treated
- Quality Construction

A	10" Color Monitor Cover	\$10.95
	13" Color Monitor Cover	\$12.95
	not shown	
B	Peripheral Expansion Box Cover	\$12.95
C	TI-99/4 Memory Printer Cover	\$9.95
	(same as Epson MX 603 cover)	
D	Cassette Recorder Cover	\$4.95
	(1 size fits all models)	
E	TI-99/4 V. Console Cover	\$8.95
F	Speech Synthesizer Cover	\$3.95
G	Peripheral Box Cover	\$5.95
	Specify: 12K Memory Expansion RS232 Interface or Disk Controller	
H	Internal Printer Cover	\$8.95
I	Disk Memory Drive Cover	\$5.95

**DEALER
INQUIRIES
INVITED**

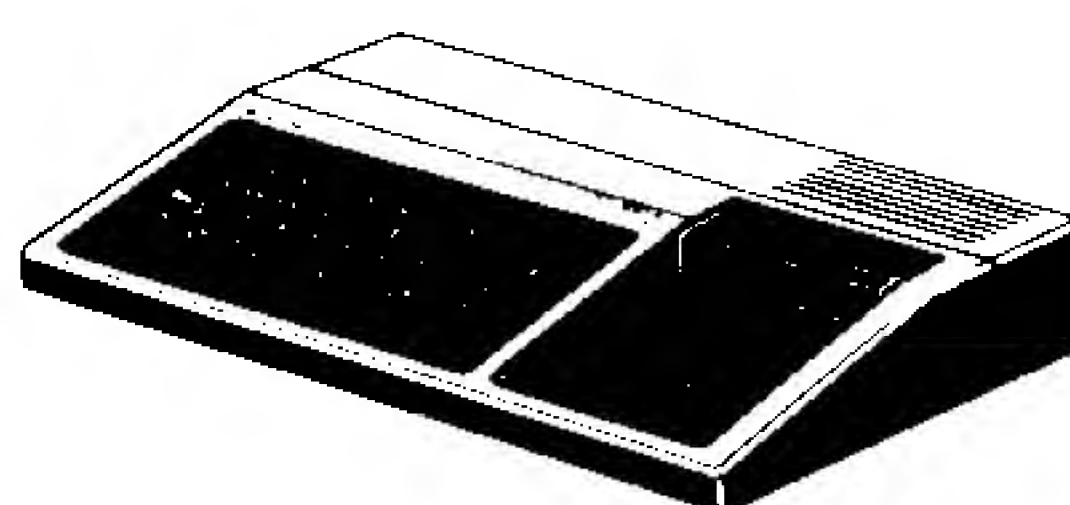
Add \$2.00 shipping/handling
for the first dustcover;
50 cents for each
additional cover.



P.O. Box 5537
Eugene, Oregon 97405
Tel. (503) 485-8796



TEXAS INSTRUMENTS



TI-99/4A \$279.00

includes console, R.F. Modulator, and
Manuals

ASK ABOUT OUR

- Dual RS232 Y-Cable
- Half Size P.E. Box Drives
- ARTHROPOD Assembly Language
Arcade Game

Mastercard or Visa by mail or phone
(add 3% charge fee)

Mail cash, check, money order.
Personal check (1 add'l. week to clear)
\$3.00 Shipping & Handling

Equipment subject to price change
and availability without notice.

Peripheral Box	199.97
Speech Synthesizer	109.97
Telephone Modem	164.97
RS 232 Interface Card	139.97
Disk Controller Card	199.97
Disk Memory Card	299.97
Memory Expansion Card	229.97
P-Code Card	199.97
10" Monitor	369.97
Joy Sticks (pair)	27.49
Mini-Memory	78.49
Dual Cassette Cable	11.97

Extended Basic	75.00
Household Mgmt.	31.49
Personal Rec. Keep	38.97
Early Learning Fun	23.49
Add Sub I or II	31.49
Video Chess	54.97
Tunnels of Doom	46.97
Car Wars	31.49
TI Invaders	31.49
Tombstone City	31.49
Munch Man	31.49
Yahtzee	19.49
Parsec	31.49
Adventure Cassette	38.97
Editor Assembler	77.97
Terminal Emulator II	38.97

TOLL FREE 1-800-441-7419
in Pennsylvania
1 - 412 - 935-2040

NORTH HILLS COMPUTER

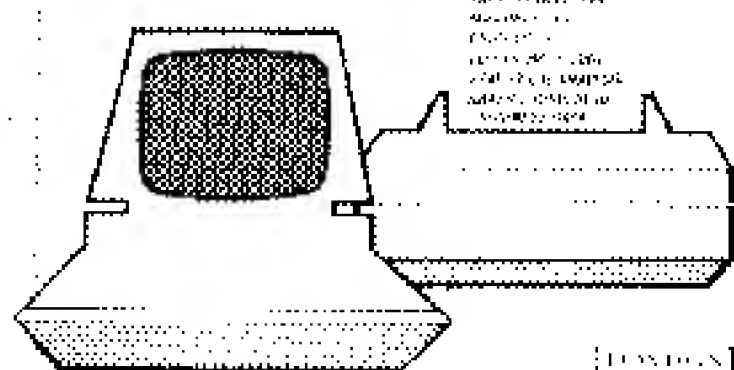
— a subsidiary of DigiCom Systems Corporation —

11570 Perry Highway, Wexford, PA 15090

Beginner's Guide for the UCSD Pascal System

BASIC Computer Programs for Business

Volume 2
Charles D. Sternberg

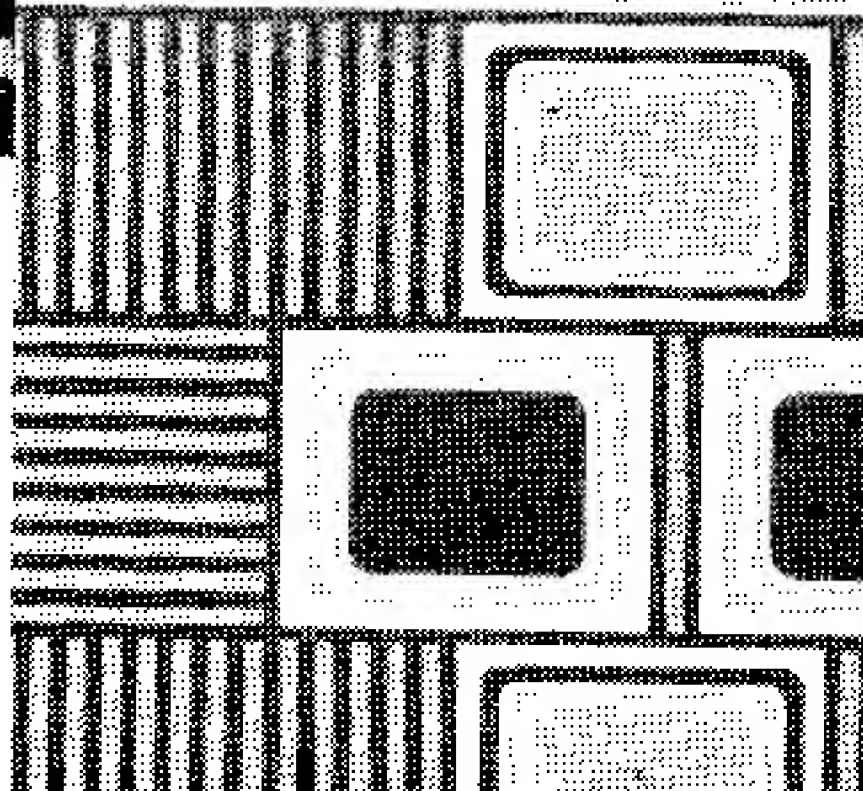


Game Playing with BASIC

BASIC Computer Programs for the Home



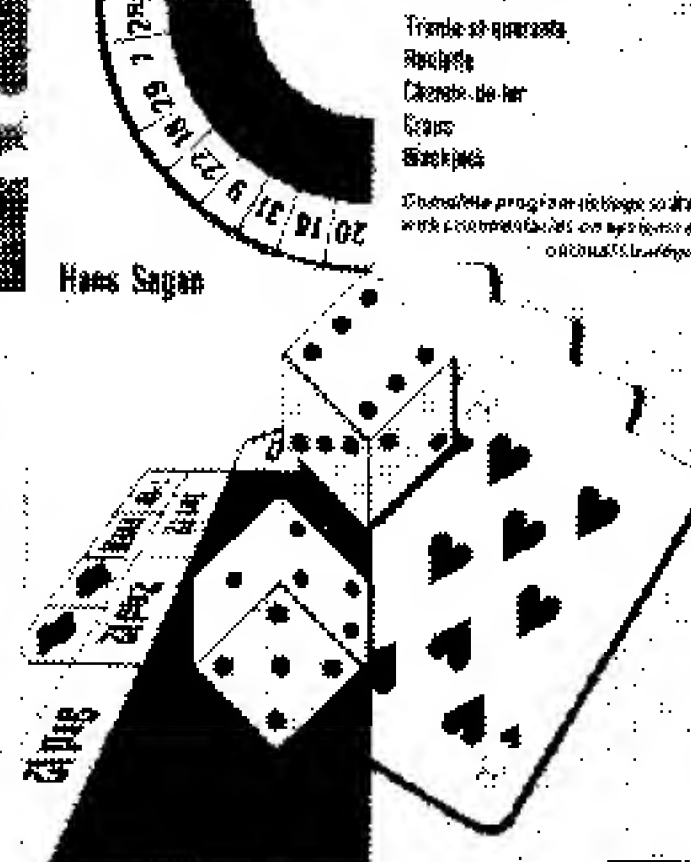
TI BASIC



BASIC COMPUTER PROGRAMS IN SCIENCE AND ENGINEERING



Microcomputer Simulations of Casino Games



NEW

NEW

BASIC COMPUTER PROGRAMS FOR BUSINESS: VOL. 1

By Charles D. Sternberg.

Each program is documented with a description of its functions and operation, a listing in BASIC, a symbol table, sample data, and one or more samples.

Volume 1 contains over 35 programs covering: budgets, depreciation, cash flow, property comparisons, accounts payable, order entry, warehouse locations, inventory turnover analysis, job routine, resource allocation, production scheduling, etc.

paper, \$12.95
1980, 384 pages, 7 x 10

BASIC COMPUTER PROGRAMS FOR BUSINESS: VOL. 2

By Charles D. Sternberg.

A collection of programs (with function and operation documentation) covering the critical facets of business operation: sales planning and analysis, personnel, word processing, mailing lists, price list systems, record control, scheduling systems, etc.

paper, \$13.95
1982, 376 pages, 7 x 10

BEGINNER'S GUIDE FOR THE UCSD PASCAL SYSTEM

By Kenneth Bowles.

This highly informative book is written by the originator of the UCSD Pascal System. It is designed as an orientation guide for learning to use the UCSD Pascal System, and features tutorial examples of programming tasks in the form of self-study quiz programs. Once familiar with the system you will find the guide an invaluable reference tool for creating advanced applications.

paper, \$12.95
1980, 204 pages, 6 x 9

BASIC COMPUTER PROGRAMS FOR THE HOME

By Charles D. Sternberg.

An invaluable book containing over 75 practical home application programs that will be helpful to the novice or experienced owner in increasing the usefulness of any home computer. Each program is documented with a description of its functions and operation, a listing in BASIC, a symbol table, sample data, and one or more samples.

paper, \$11.95
1979, 336 pages, 7 x 10, illus.

GAME PLAYING WITH BASIC

By Donald D. Spencer.

Enjoy the challenge of competition with your computer. Amuse yourself with such games and puzzles as 3-D Tic-tac-toe, Nim, Roulette, Magic Squares, the 15 Puzzle, Baccarat, Knight's Magic Tour, and many others. The writing is nontechnical, allowing almost anyone to understand computerized game playing.

paper, \$11.50
1977, 176 pages, 6 x 9, illus.

BASIC COMPUTER PROGRAMS IN SCIENCE AND ENGINEERING

By Jules H. Gilder.

Save time and money with this collection of 114 ready-to-run BASIC programs for the hobbyist and engineer. There are programs to do such statistical operations as means, standard deviation averages, curve-fitting, and interpolation. There are programs that design antennas, filters, attenuators, matching networks, plotting, and histogram programs.

paper, \$11.95
1980, 160 pages, 6 x 9, illus.

PRACTICAL BASIC PROGRAMS

Edited by Lon Poole

Here is a new collection of 40 programs you can easily key in and use on most microcomputers. Each program does something useful. Practical BASIC Programs is especially useful in small business applications. It solves problems in finance, management decision, mathematics and statistics. It requires no prior programming knowledge. Each program is thoroughly documented. The book contains sample runs, practical problems, BASIC source listings, and an easy to follow narrative to help you realize the potential uses of each program.

paper, \$16.50
1980, 200 pages, 8 1/2 x 11

INTRODUCTION TO TI BASIC

By D. Inman, R. Zamora, and R. Albrecht.

This comprehensive work will teach you all about computer and BASIC for use with the Texas Instruments Home Computer. Even if you've never worked with a computer, you can now teach yourself how to use, program and enjoy the TI Home Computer with this entertaining, and easy-to-read work. The authors have carefully constructed this introduction so that you will soon be writing BASIC programs and exploiting all of the excellent features of the TI machines. Its 14 chapters and Appendices cover all of the essential programming statements and machine features.

paper, \$12.95
1980, 384 pages, 7 x 10

INTRODUCTION TO PASCAL (INCLUDING UCSD PASCAL)

By Rodnay Zaks

This is the first book on Pascal that can be used by persons who have never programmed before, but more generally it is a simple and comprehensive introduction to standard and UCSD Pascal for anyone—beginner to experienced programmer—who wants to learn the language rapidly. The logical progression and graduated exercises—designed to provide practice as well as test skill and comprehension—enable the reader to begin writing simple programs almost immediately.

paper, \$16.95
1981, 440 pages, 7 x 9

BEAT THE ODDS: MICRO-COMPUTER SIMULATIONS OF CASINO GAMES

By Hans Sagan.

Here's an extremely useful programming guide that provides realistic simulations of five popular Casino games: Trente-et-Quarante (Thirty and Forty), Roulette, Chemin-de-Fer, Craps, and Blackjack. Each of the five chapters has the same structure. It begins with a computer run, displaying facets of the programs, followed by an explanation of the objectives and the physical execution of the game. Acceptable bets and how to place them are discussed and systems and/or strategies laid out. Finally, the computer program is developed and various modifications of the program are detailed.

paper, \$9.95
1980, 128 pages, 6 x 9

Use the order card in the back of this magazine, or itemize your order on a separate piece of paper and mail to: 99'er Magazine/Book Dept., P.O. Box 5537, Eugene, Oregon 97405. Be sure to include check or detailed credit card information. Shipping and Handling: In U.S.A.—\$2.00 for one book; 75¢ for each additional book. Foreign Surface—add \$2.00 to total U.S.A. shipping costs. Please allow 4-6 weeks for delivery. If there is a question regarding your order please write to Customer Service at the above address. PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

CINTRONICS

"The Printer People"

2284 Donnington Lane

Cincinnati, OH 45244

513/232-7784

Authorized Service Center for C. Itoh

Be assured that Cintronics will not sell you a printer unless it is totally compatible with your TI computer. Each printer and cable is pre-tested before shipment.

DOT MATRIX PRINTERS*

C. ITOH - One Year Warranty

Prowriter 8510 Parallel 399

Prowriter 8510 Serial..... 549

Prowriter 1550 Ser/Par..... 725

Prowriter 1550 Parallel..... 679

STAR MICRONICS - 180 Day Warranty

Gemini-10..... 359

Gemini-15..... 539

For package including word processing, mail-merge programs and cable add \$70 to above prices.

DAISY WHEEL PRINTERS*

C. ITOH - One Year Warranty

Starwriter F10-40..... 1249

Printmaster F10-55..... 1519

SMITH-CORONA - 90 Day Warranty

TP-1..... 549

Check our special package prices for printer/TI peripheral combinations.

ACCESSORIES**

RS232 or Parallel Cable..... 29.95

Ribbons for C. Itoh Printer..... 5.95

Ribbons for TP-1..... 6.95

Elephant Memory System Disks

5 1/4" SS/SD Box of 10..... 17.95

Elephant Trunk

5 1/4" Floppy Disk Storage..... 21.95

Head Cleaning Kit (5 1/4")..... 24.95

Cloth Printer Cover..... 12.95

SHIPPING - Please Include:

*2%

**\$1.50 for first item and 25¢ each additional item

Prices shown are for prepaid orders.

Allow 2 weeks for personal checks to clear.

All prices and offers subject to change without notice.

Cintronics is dedicated to provide quality service. We welcome calls for technical assistance.

Secretary . . . from p. 35

Every time you ENTER a transaction, the new balance is automatically computed so that it is always current. Faculty advisors and school secretaries do not have to remember to tabulate the balance after each deposit or withdrawal because the computer never forgets to do it. Faculty advisors will also know immediately after they complete a transaction how much is left to spend. By printing the Transaction Register, the faculty advisors can check and review all the pertinent details of each transaction in that account.

Before *Activity Accountant*, faculty advisors had to fill out endless forms in duplicate and triplicate to open activity accounts and record transactions. The manual contains two forms which you may reproduce to use with the cartridge. They are easy to fill out and are designed primarily for the use of activity sponsors and secretaries.

"Scott, Foresman and TI have reduced the energy drain of paperwork and time-consuming record keeping that comes with providing quality extracurricular activities for our children."

The Account Status form is really two forms in one. The top half of the form is to open an account and the bottom half is a Change of Status form to terminate the account or transfer its funds. In both cases, the reason for the form is to provide a place for the necessary signatures that indicate the action has been approved.

The other form included is the Transaction Record which is meant to be an ongoing handwritten record of all transactions, and proof that approval was obtained when a transaction needed to be edited or deleted. Again, the form is necessary to protect the security of the accounts so that transactions are not changed without written authorization. Frequent use of either of these forms would be rare and perhaps a sign that the accounting cycle in use might need to be re-evaluated.

Data Security

A very real concern of any school system using *Activity Accountant* is the security of the financial data. The forms included will, if used properly, provide for reviewing and authorizing accounts before any changes can be made. Scott, Foresman has made sure that termination of an account is not easy: The procedure to delete an account contains three points at which the user is told that the account cannot be deleted unless the proper sequence of steps is followed. With these safeguards, plus the confidential school and activity account code number for access to the data, it is unlikely that the information will fall into the wrong hands. The manual does make several other suggestions on pages 56-57 to ensure the security of your work—including separate storage spots for the Command Cartridge, master diskettes and backups.

Error Handling

Just as unauthorized use or alteration of data is not likely to happen with this system, it is also improbable that a crucial error will occur when using this application. Scott, Foresman seems to feel that the best way to handle errors is to prevent them in the first place, and this is just what *Activity Accountant* does. When ENTERing an activity on the account roster or editing a

transaction, you will see the prompt, ANY CHANGES ☐, at the bottom of the screen. You must answer the prompt with either Y (yes), N (no) or E (END) before the application can continue. You are thereby reminded to go back to check your typing, your figures and decimal points! If you type Y, the cursor goes back to the first response you typed in and gives you the opportunity to correct each of your responses. If a correction is not necessary for a given response, simply press ENTER to move the cursor to the next input box. Keep pressing ENTER until you arrive at the error.

It should be noted here that (to guard against error) you cannot record a receipt and a disbursement on the same screen. The application will automatically compute the balance after a receipt is ENTERed, thus skipping over the disbursement input box. You cannot ENTER both, even if you try to do so. A similar precaution is built in as help when you come back to work with accounts later. When you call up an account to edit, perform a transaction, or to print a report, the prompt, IS THIS THE DESIRED DATA? is displayed. The application is helping you make sure you do not ENTER data to the wrong account.

ENTER an account or school code that has already been assigned. The only errors that the computer will not catch are the mistyping of figures or misspelling of names. Even then, the ANY CHANGES? prompt, which reminds you to check your entry over, will decrease the chances that mistakes of this nature go unnoticed.

In these times of economic upheaval it is appropriate that the public should want the schools they support with their dollars (tax and otherwise) to provide a stimulating learning environment for their children. All who work in education, secretaries, teachers, and administrators alike, do strive to do just that. Sometimes, however, the good people with good ideas for our children do not have the extra energy and time to make things come together. Scott, Foresman and TI have reduced the energy drain of paperwork and time-consuming record keeping that comes with providing quality extracurricular activities for our children. We can only hope that districts will use this excellent *School Management Applications* software to do just that.

99'er

Cut & Paste . . . from p. 11

Some options may or may not be important to you, depending on your kind of writing. Are you writing a long work such as a novel or a list of household chores scheduled for summer? Then you'll want a page-numbering feature that will adjust the whole manuscript's *pagination* for pages taken out or put in. And how about a name or title at the top of each page? Some software can do it, others can't.

Some other considerations: For people in a great hurry, there are time-saving devices which vary from program to program. For example, the cursor in some programs moves much more rapidly than in others. Other software lets you correct a single character simply by typing another over it anywhere on the screen.

How about an *error recovery* feature or "oops key" that allows you to *bring back* text you just deleted by accident? You probably will never need such a thing, but it is fun to demonstrate to your friends . . .

Yes, these details need your attention before you hurry through that last little bit of writing by hand—in your checkbook, that is. Since pre-purchase research always pays off and gives you a better idea of what to look for in a word processor software package, we have a companion article for you entitled *Word Processor Market Basket*. Here you will find four of the available word processing packages compared and rated in easy to comprehend charts.

99'er

MULTIPLAN . . . from p. 31

the formula in relative terms (for example, using "the row above this one" instead of "row 5"), the same formula can be used for every balance. In the sample, there are 6 more lines of checks and income, so you should copy the formula down 6 cells. With the cell pointer still at R6C10, invoke the command COPY, then choose the option DOWN. Type 6 at NUMBER OF CELLS and press ENTER. The system will copy the formula down 6 cells. For now, this will give you identical balances in all 7 cells because there are no income or expense figures below row 6 yet. This will change as you make more entries.

The Grand Total

After you finish filling in the checks and deposits, the final touch is to add totals for the income and expense columns. Label the totals line by skipping a row after the last check and entering TOTALS under the Paid to column. Arrow one to the right, and get ready to enter a formula by typing =. We'll use the SUM function again. Enter SUM(and then arrow up to R6C3 for the first item to sum. Type : and then choose R12C3 with the up arrow. Finish off your formula by typing), check that the formula is SUM(R[-8]C:R[-2]C), and then press ENTER and see the Income total appear. To total the other columns, just Copy the formula 6 cells to the right.

It would be a good idea to save the worksheet on disk now. You should not use the *Multiplan* disk to store your models. If you have only one disk drive, you should remove the *Multiplan* disk and mount a work disk.

If you have a printer, now would be a good time to print the worksheet. Follow the procedures on pp. 84-86 in your manual. One thing to change here is the left print margin. The checkbook model has 10 columns of 8 characters each, or 80 print positions. This will fit exactly on many printers, as long as we use a left margin of 0. Another thing to change here is the print width; you want to use 80 instead of the default 70. Type 0 for left margin, TAB over to print width, type 80, and press ENTER. Then you have to set the options for your printer. You enter the command PRINT by pressing P. TAB over to SETUP: and type the string you usually use in OPEN statements in BASIC programs, without the quotes (e.g., RS232.BA=1200.PA=0.DA=7). Then press ENTER. You'll find yourself back at the PRINT command line again. Press ENTER to select option Printer. Figure 3 shows the printed output. When the system is finished printing, you might save your model again to preserve the printer margins and options just set. This time choose the TRANSFER command, followed by option Save. The Save option will default to the same file name you used above, so just press ENTER. The system will ask if it's OK to write over the file; answer Y for yes.

That's all there is to it! We'll leave *Multiplan* for now, but next time we'll explore some of *Multiplan's* theories, and present some general strategies for using the package. We'll also talk about what *Multiplan* is *not* good for and describe *templates* in general terms.

99'er



"Fifteen men on the dead man's chest
Yo-Ho-Ho, and a bottle of Rum."
Your five man diving team has found the lost
treasure of Blackbeard the pirate! Unfortunately
it is at the bottom of a shark infested sea and it
is protected by two giant Octopuses!!

***** **Warning** *****

The sharks haven't been fed since the last
time someone played this game and they love
to eat divers!!!

Automatic multi-level game with free plays.
Beautiful full color graphics and special sound
effects. Written in Extended Basic.

Cassette-G06C-14.95 Disk-G06D-17.95
CA residence Add 6% State Tax
1st class shipping/handling-1.50

MG Free Game Brochure Available
MILLERS GRAPHICS
1475 W. CYPRESS AVE. • SAN DIMAS, CA 91773
(714) 599-1431

CASSETTE **MORE 3D ACTION** DISK

MEAN STREETS
FAST MOVING ACTION!
COPS & ROBBERS

\$17.95
PPD
EXT. BASIC

DON'T FORGET OUR ORIGINAL
3-D GAME **QUADRANT**
Alpha COMMAND
SPACE ADVENTURE!
SOFTWARE \$17.95

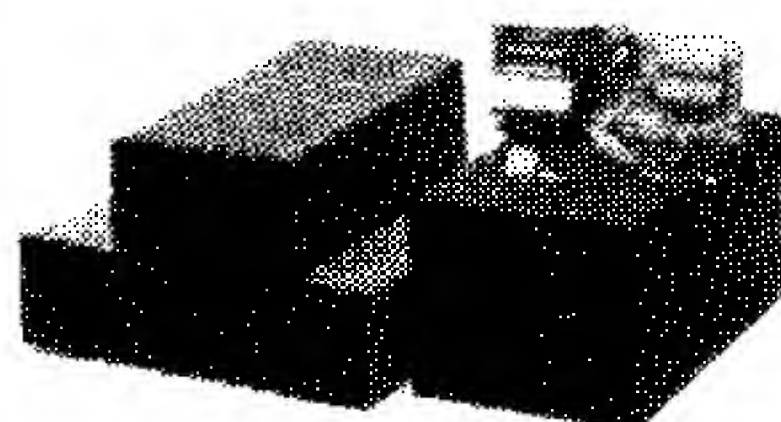
FREE CATALOG
SASE

BOX 463, WEST SENECA, NY 14224

TI-99 DRIVES, BY SHUGART

The Shugart reputation for quality
and reliability—now only \$197.50

(• internal or external • 270 day warranty)



- TI-99 External
Drive case/supply
- Accommodates all 5 1/4 drives
 - Over current, over voltage protected
 - 120 day warranty

Power Supply/Case Assemblies

- Dual Drive horizontal mount.....74.95
- Dual Drive vertical mount.....74.95
- Single Drive horizontal mount.....39.95
- Dual open frame supply.....54.95
- 2 drive cable.....21.00
- 4 drive.....32.00
- Dual case, horiz or vert (w/o PS).....24.95
- Single case, horiz.....18.95

Terms: Personal checks allow 14 days, COD, MO., Certified
Checks . . . Credit Cards add 3.5% Shipping and Handl-
ing: \$3.00 West and \$5.50 East states. All shipping UPS sur-
face, other means extra.

Send to:

Computer Peripheral Resources

P.O. Box 834 or call:
Oak Harbor, WA 98277 (206) 679-4797

FFF Software Presents . . .

SHUTTLE COMMAND

Earth is threatened by thousands of Russian Attack Military
Satellites (RAMS). The United States readies the space shuttle
Enterprise to combat the menace and selects you as its
commander.

Your view is from the cockpit and you see the RAMS approach
(in 3-D) from deep space. Your mission is to destroy them before
they destroy Earth — or you!

The producers of the now-classic TI-ASTEROIDS bring you a new
and challenging space game. Joysticks are optional, but recom-
mended, for this exciting Extended BASIC program which features
1 or 2 player capability, 12 skill levels and great graphic effects.

Available for only \$17.50 on cassette or diskette

Also Available . . .

TI-ASTEROIDS

See what the Experts are saying:

" TI-ASTEROIDS is by far the best space game we have
seen programmed for the 99/4 in an [Extended] BASIC
Language. "

Charles LaFara, President
International 99/4(A) Users Group
Newsletter (Vol. 1, No. 7)

" I was impressed to see what could be done in Extended
BASIC . . . by such firms as FFF Software (Trenton, NJ)
with their TI-ASTEROIDS game . . . "

Gary M. Kaplan, Editor
99'er Magazine (Vol. 1, No. 4)

Available for \$17.50 on cassette or diskette
or for only \$10.00 if purchased
together with SHUTTLE COMMAND.

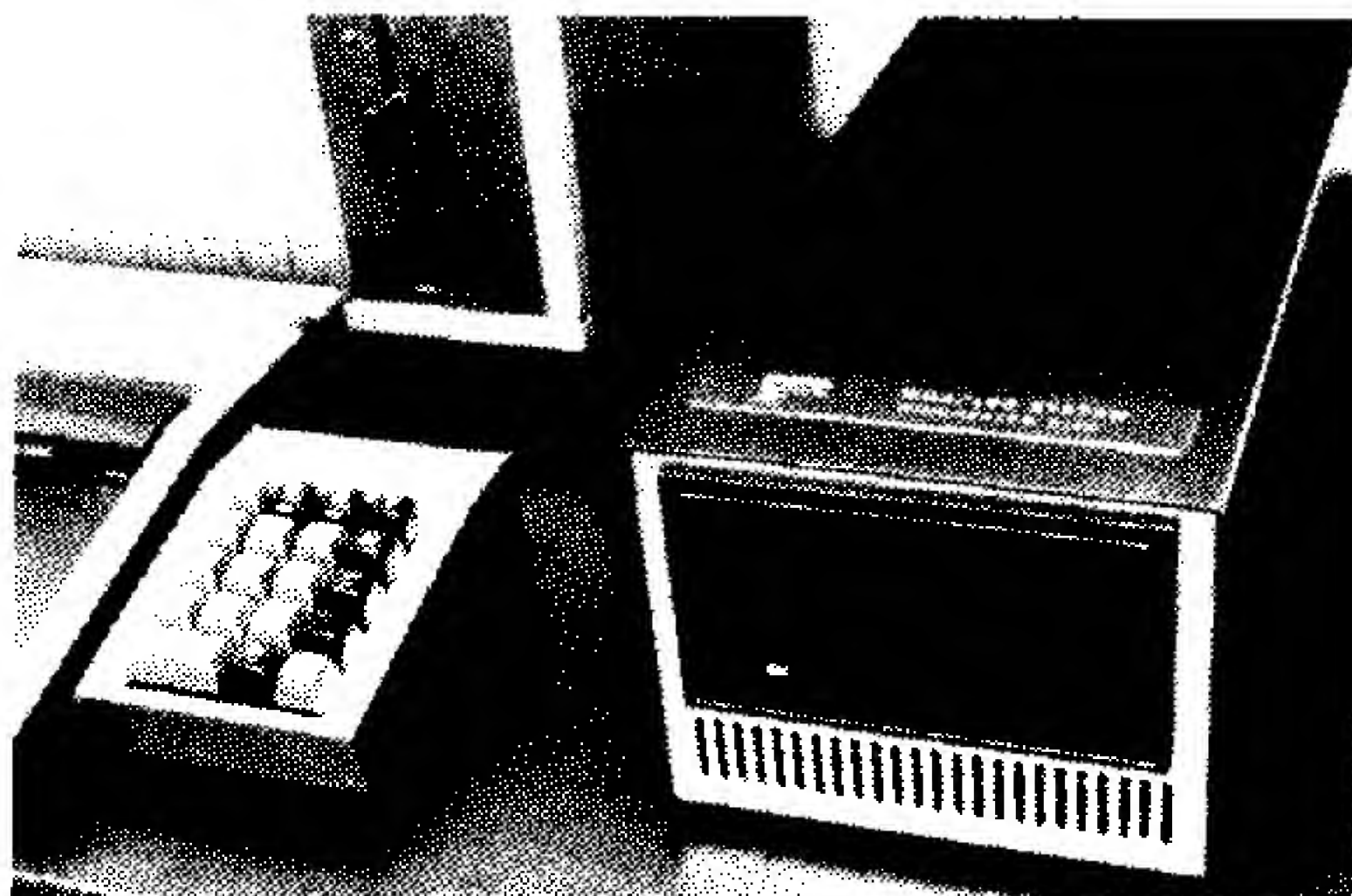
TO ORDER WRITE:

FFF SOFTWARE
P. O. Box 4169
Trenton, NJ 08610

NOW SHOWING

THE MYARC WINCHESTER DISK AND CONTROLLER SYSTEM

Available for TI-99/4A in 5 or 10 megabyte models



- ☐ Customized "directory" management
- ☐ Reliable back up
- ☐ Easy installation
- ☐ TI extended basic and assembly language support
- ☐ State of the art ecc
- ☐ Complete array of disk utilities

DEALER INQUIRIES INVITED

ALSO STARRING

Our **CUSTOM DESIGNED** *COMPU*SOFT
BUSINESS SOFTWARE
and
THE NUMERIC DATA ENTRY PAD
SPEEDKEY

It works Exclusively With *COMPU*SOFT Software

COMING ATTRACTIONS

- | | |
|---|---|
| <input type="checkbox"/> Accounts receivable! | <input type="checkbox"/> 1040 tax system! |
| <input type="checkbox"/> Word processing! | <input type="checkbox"/> Mailing list! |
| <input type="checkbox"/> Accounts payable! | <input type="checkbox"/> General ledger! |
| <input type="checkbox"/> Agricultural! | <input type="checkbox"/> Inventory! |
| | <input type="checkbox"/> Order entry! |

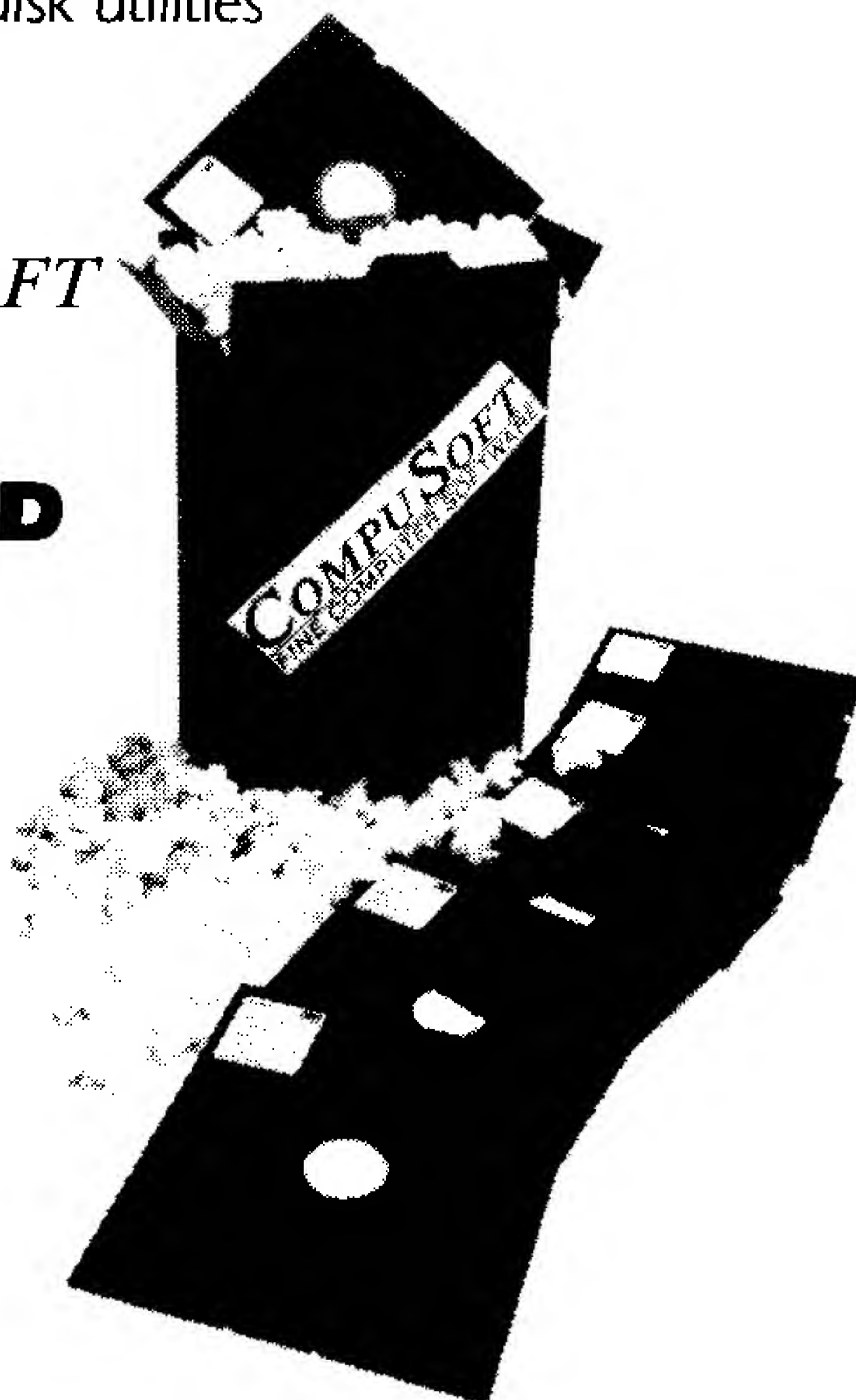
Dealer Inquiries Invited

Distributed Exclusively By

*COMPU*TECH DISTRIBUTING

209 E. WALNUT SPRINGFIELD, MO 65805

417-869-1684





SUPER LANGUAGE

A Home Computer Assembly Language Series

Mini Memory Relocator

RAMpaging Through Memory

A Program By Martin Kroll, Jr.

218 Kaplan Ave.
Pittsburgh, PA 15227

BASIC

If you purchased your Mini Memory cartridge thinking you would have 4K of RAM in which to write Assembly Language programs, you may find yourself a bit disappointed. In order to write in Assembly Language, you need an *assembler*, a program which takes your assembly statements and converts them into the machine code the computer can understand. The Line-by-Line Assembler that comes with the Mini Memory only lets you assemble one line at a time, until you have written your program. And even this simple assembler requires Mini Memory to run in, so you won't have all the RAM to use for your program. There is, however, a remedy for this limited memory problem, which we present in the form of the *Mini Memory Relocator*.

This program will let you move any program in Mini Memory from one location to another. You may ask "What good will that do, when the amount of memory space is still small?" First, it will let you make use of the space taken by the assembler, once the program has been written in. It will also allow you to write several short programs, or subroutines, move them to predetermined locations, then load another program and move it to its own location, thus making more efficient use of the memory you have.

For example, suppose you have written four subroutines. For simplicity's sake, let's say that each subroutine was assembled to start at location 7D00 and end at 7DFF. You can take the first routine, and move it to 7300-73FF, relocating two other routines at 7400-74FF, and 7500-75FF. These routines can all be linked together, either internally with each other, or by a fifth routine you can write to access each subroutine.

The Program

The program is, of course, written in TI BASIC so that it can be used with the Mini Memory cartridge. The Mini Memory cartridge must be installed before the program can function. Failure to install it will cause the program to halt with an error.

When running the program, the user will have to answer some questions pertaining to the program's relocation. First, the program asks: DO YOU WANT TO DO LIMIT CHECKS FOR MEMORY BORDERS. (Y/N). In other words, the system is asking whether you want it to alert you if the relocator program tries to go outside of a predetermined area of memory. For example, let's say you already have a subroutine which takes up locations 7200-72FF. If you set the low memory limit to 7300, any time the relocator program tries to go below that location, it will stop moving, inform you, and ask if the move outside the limit is valid.

After telling the system that you wish to do limit checks, you must then enter the HIGH and LOW limits. Any time the program being relocated exceeds those limits, you will be notified and asked whether you want to enter new parameters or continue as is. In only one circumstance will you not be allowed to re-enter the parameters—if the relocator is already in the process of making the move when it encounters the limit error. Then your choice will be to either continue as is, or halt the program, and reload Mini Memory with the code to be relocated.

Next, the relocator will ask: FIRST ADDRESS OF MEMORY TO BE RELOCATED? (4 DIGIT HEX ADDRESS). This will be the very first location in which code for your program occurs. (This includes data as well.) The next ques-

tion asks: LAST ADDRESS OF MEMORY TO BE RELOCATED? (4 DIGIT HEX ADDRESS). After that is keyed in, you will need to enter the entry address of your program. This is the address that gets put into the REF/DEF table and tells the computer where the starting instruction is located. This location cannot be DATA or your code will not run.

The next question you are asked is RELOCATE MEMORY TO WHICH ADDRESS. You then enter the new address to which your code will be moved. To continue our example, if the first address of memory to be relocated were 7D00, and the address to which it moved were 7200, then all code starting at 7D00 would now start at 7200. Any internal location references (such as instructions which refer to relative addresses) will be modified so that after the move, the code should be ready to run.

There are two more options which you must consider before the move takes place. The first is whether or not you want a hard copy report of the relocation. If you have a printer, you may want to select this option to keep a permanent record while developing your assembly program.

The last option lets you either update the REF/DEF table or leave it as it is. You may be relocating code which you do not want entered in the REF/DEF table. If so, you can answer no to this option. If you choose to update the REF/DEF table, you can either replace an existing entry or add a completely new one. If you want to re-

EXPLANATION OF THE PROGRAM		
<i>Mini Memory Relocator</i>		
Line Nos.		
100-160	Header and REMs.	1080-1240
170-240	Dimension arrays, and initialize variables.	1250-1680
250-360	Input option for limit checks.	1609-1790
370-610	Input memory addresses.	1800-1900
620-680	Input printer option.	1910-2030
690-940	Input option to update the REF/DEF table.	2040-2300
950-1070	Set up variables for the memory move.	2310-2490
		2500-3000
		3010
		Transfer memory.
		Update the REF/DEF table.
		Convert a hexadecimal value to a decimal value.
		Convert a decimal value to a hexadecimal value.
		Subroutine to input a 4 digit hexadecimal address and check limits.
		Print the final report on the screen.
		Optional print routine for the printer.
		Error messages.
		The end.

MAGIC Software, Inc. Presents

All new - Assembly Language Games
for the TI99/4 with Mini Memory or
expansion RAM. Fast - Fun - Fairly
Priced. Available on disc or cass.

BOMBER BOXER Cat & Mouse 3DMAZE and more....

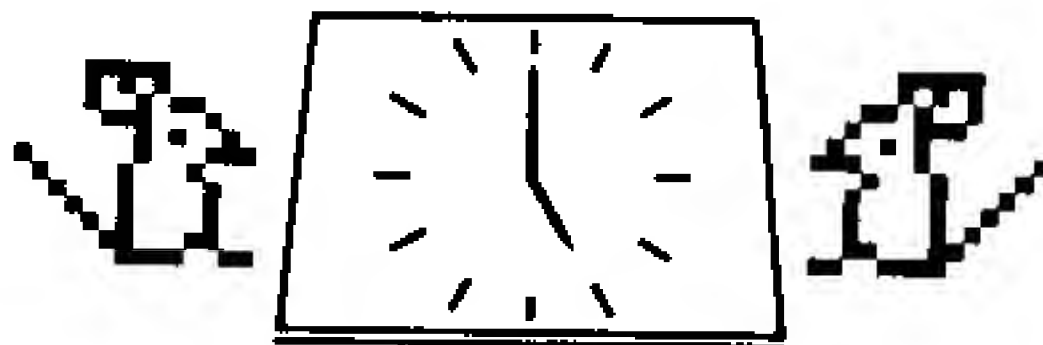
	Cass.	disc
Pricing: 1 game	\$12.00	\$14.00
2 games	\$22.00	\$24.00
3 games	\$31.00	\$32.00
4 games	\$40.00	\$40.00

For descriptions - send 1g. SSAE
To ORDER - send check to:

MAGIC Software, Inc.
3148 South 14th Street
Milwaukee, Wisconsin 53215

TIME TUTOR

CHILDREN LEARN
TO TELL TIME
AND HAVE FUN DOING IT



WITH MUSIC
ANIMATION AND COLOR

Children love to watch the mouse
perform to nursery rhyme music
as a reward for correct answers.

FOR THE TI-99/4A
EXTENDED BASIC REQUIRED

SEND \$12.95 FOR CASSETTE
J.K.S. SOFTWARE
212 MAPLE ROAD
WALLINGFORD, PA. 19086

QUALITY SOFTWARE TEX-WRITER

A word processor that gives you
total control. Suitable for compos-
ing and printing personal letters,
resumes, mailing labels, business
records, and books.

Full upper and lower case—even
on the 99/4. Variable margin,
selectable line length, and
automatic page numbering.
Underlining. *Italics*. **Emphasized**. 4
print sizes including Expanded
and Compressed. Full cursor con-
trol for complete text editing
without retyping!

Requires Extended Basic, one
disk drive, and RS232 compati-
ble printer (Epson, T.I. Impact,
etc.)-----\$44.95

SEND FOR FREE CATALOG
OF ADDITIONAL PROGRAMS.

SEND CASH, CHECK, OR MONEY ORDER,
FREE SHIPPING IN THE U.S.
CANADIAN RESIDENTS ADD 20%.
PA RESIDENTS ADD 6% SALES TAX.

SOFT-TEX

TI 99/4(A) SOFTWARE
SOFT-TEX
3 WALNUT LANE
BERWYN, PA 19312

place an old entry, you will need to sup-
ply its name. If the name does not exist,
NOT IN THE TABLE will be displayed. Upon
entering the name of the REF/DEF entry,
the program will be relocated. When the
move is complete, a report will be printed
on the screen. If you earlier chose the
printer option, pressing ENTER will pro-
duce your printed report and then end the
program. Otherwise, you will need to
copy the information from the screen
before halting the program.

Now that you don't have to worry quite
as much about running short on memory,
you will be able to more fully explore the
world of Assembly Language program-
ming. The more ambitious you are as a
programmer, the more uses you will find
for this program (with a few modifications).
The only limit is your imagination, so hap-
py computing—and don't let the program
bug bite.

99'er

```

100 REM *****
110 REM * MEMORY RELOCATOR *
120 REM *****
130 REM BY MARTIN KROLL JR
140 REM 99'er VERSION 2.7.1MM
150 REM
160 REM
170 REM DEFINE DIVISOR/MULTIPLIE
R FOR NUMBER CONVERSIONS
180 DIM S(4),PNAME$(20),PLOC$(20,2
)
190 LM=28672
200 HM=32767
210 S(1)=4096
220 S(2)=256
230 S(3)=16
240 S(4)=1
250 CALL CLEAR
260 PRINT "DO YOU WANT TO DO LIMIT
": "CHECKS FOR MEMORY BORDERS."
270 INPUT "(Y/N)":CT$
280 PRINT ":::
290 IF (CT$<>"Y")*(CT$<>"N") THEN 2
60
300 IF CT$="N" THEN 370
310 PRINT "HIGH MEMORY LIMIT?"
320 GOSUB 1910
330 HM=TN2
340 PRINT "LOW MEMORY LIMIT?"
350 GOSUB 1910
360 LM=TN2
370 PRINT "FIRST ADDRESS OF MEMORY
TO BE RELOCATED?":
380 GOSUB 1910
390 A=TN2
400 FAP$=TEMP$
410 PRINT "LAST ADDRESS OF MEMORY
TO BE RELOCATED?":
420 GOSUB 1910
430 B=TN2
440 IF B<=A+1 THEN 2970
450 LAP$=TEMP$
460 PRINT "FIRST EXECUTION ADDRESS
OF THE PROGRAM (ENTRY ADDRESS
S)?":
470 GOSUB 1910

```

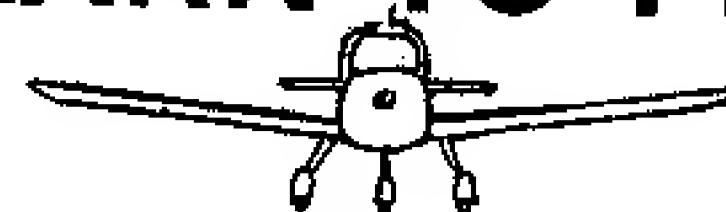
```

480 C=TN2
490 EAP$=TEMP$
500 IF (C<A)+(C>B) THEN 2990
510 PRINT "RELOCATE MEMORY TO WHIC
H": "ADDRESS?":
520 GOSUB 1910
530 D=TN2
540 IF D>A THEN 570
550 K=0
560 GOTO 580
570 K=1
580 IF CT$="N" THEN 610
590 IF D<LM THEN 2590
600 IF D+(B-A)>HM THEN 2500
610 NPA$=TEMP$
620 PRINT "DO YOU WANT A PRINTED R
EPORT ON THE CHANGES IN MEMORY?"
630 INPUT "(Y/N)":PR$
640 PRINT ":::
650 IF (PR$<>"Y")*(PR$<>"N") THEN 6
20
660 IF PR$="N" THEN 690
670 INPUT "PRINTER DEVICE:":DEV$
680 PRINT ":::
690 PRINT "WANT REF/DEF TABLE UPDA
TED?"
700 INPUT "(Y/N)":RD$
710 PRINT ":::
720 IF (RD$<>"Y")*(RD$<>"N") THEN 6
90
730 IF RD$="N" THEN 950
740 PRINT ":::
750 PRINT "DO YOU WANT TO REPLACE
A": "REF/DEF ENTRY?":
760 INPUT "(Y/N)":RP$
770 IF (RP$<>"Y")*(RP$<>"N") THEN 7
50
780 IF RP$="N" THEN 910
790 INPUT "NAME OF OLD REF/DEF TAB
LE ENTRY TO BE REPLACED:":NM
$
800 NM$=SEG$(NM$&")",1,6)
810 CALL PEEK(28702,N,D)

```

Continued on p. 68

LEARN TO FLY!



REVIEWED IN JAN. 99'er

The Dow-4 Gazelle is a simulation of
a 4-place, single-engine, high perform-
ance aircraft, which will provide fun
and challenge as you learn to fly. A high
quality program written by a professional
programmer/analyst who is also an
experienced instrument-rated pilot, the
Gazelle is a real-time simulation which
responds rapidly to the controls (within
one second on the average).

On your screen you see the instrument
panel, which has 10 dials with moving
pointers and 11 indicator lights. The
plane is flown with the joystick, while
the keyboard is used to control power,
flaps, fuel, etc.

The manual contains 30 pages of text,
a glossary, and seven full page figures.
It introduces you to the art of flying
and leads you, a step at a time, from
novice to professional. Learn to take-off,
land, navigate, fly instrument approaches,
and more. If you get into trouble, you
can freeze the action in case you need
time to assess your situation. Sound
effects add to realism.

This program pushes the TI-99/4(A) to
its limits. For both 99/4 and 99/4A,
Does not require anything other than a
joystick and cassette recorder.

Send \$30.00 to:
John T. Dow
6360 Caton
Pittsburgh, PA 15217
PA residents add 6%

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

PRICE BREAKTHROUGH

Super Sale on New Disk Drives

Starting at \$199.95 complete
with Power Supply and Case!!

Tandon — Siemens — Remex — MPI — Teac

single sided 40 track — dual sided 40 track
single sided 80 track — dual sided 80 track

for
**RADIO SHACK¹ — HEATH/ZENITH² — APPLE³
IBM/PC⁴ — TEXAS INSTRUMENTS⁵ & MOST OTHER COMPUTERS**

Drive a Hard Bargain!!™

**8 M.B. - 12M.B. with Power Supply Case, Cables & Software
Complete Systems from \$1,595.00**

**Amazing Special!-dual sided 40TK or 80TK drive with Power Supply and Case
and Our Special Warranty - Starting at \$259.95**

**TOLL FREE ORDERING GENERAL AND TECHNICAL
1-800-343-8841 1-617-872-9090**

- Model III Internal Disk Drive Kits **\$Call**
- Color Computer Drives 0123 **\$Call**
- Diskettes of all sizes (Box of 10). **starting at \$20.00**
- Dot Matrix Printers **\$Call**
- Word Processing Printers **starting at \$899.95**
- Printer Buffers 8K to 512K **starting at \$143.95**
- Disk Drive Cases and Power Supplies . . . **starting at \$49.95**
- DOSPLUS — 3.4 — **\$Special Price**

One Year Warranty Available on all Drives!

Dealer inquiries invited.

SOFTWARE SUPPORT, INC.

One Edgell Road, Framingham, MA 01701
(617) 872-9090

Hours: Mon. thru Fri 10 am to 6 pm (E.S.T.)
Sat. 10 am to 5 pm

Copyright 1983 ©

TERMS:
M.C./Visa/Amex and personal
checks accepted at no extra charge.
C.O.D., please add \$3.00.
Shipping: Please call for amount.

- 1 "TANDY CORPORATION
- 2 "ZENITH DATA SYSTEMS
- 3 "APPLE COMPUTER CORP.
- 4 "IBM CORPORATION
- 5 "TEXAS INSTRUMENTS

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES



PORTABLE

COMPUTING

Touring Compact Computer Country

PART II: A FURTHER LOOK AT THE CC-40 COMPACT COMPUTER

By Gary M. Kaplan

In this article, we will begin exploring the Enhanced BASIC language that is resident in the CC-40. The Enhanced BASIC in the compact series resembles TI Extended BASIC more than the 99/4 console BASIC, in that it uses the additional features of Extended BASIC, and then adds its own particular extensions to create the "Enhancer!" version.

To illustrate a basic difference between the two BASICs, let's look at the way a user would edit program lines on the machine. With the CC-40's Enhanced BASIC, you cannot delete a line by entering its line number alone. You must use the DELETE key word. This DELETE key word can also delete a group of program lines. You can go into the DELETE mode by either pressing [FN] [DEL], or by typing DELETE or DEL. You then key in: a single line number to delete a single line; the line number followed by a dash which deletes that line and all following lines; the dash preceding a line number which deletes that line and all preceding lines; or a line number, a dash, and another line number, which deletes that inclusive range of lines.

DEL 150	Deletes line 150.
DEL 150-	Deletes line 150 and following lines.
DEL -150	Deletes line 150 and all preceding lines.
DEL 150-200	Deletes lines 150-200 inclusive.

Play It Again

A nice feature is the play-back key, [SHIFT] [PB] which causes the previously displayed line to reappear. This is useful if the line of code is similar to the previous line. You can play back the previous line into memory, make the necessary changes, and enter it. This avoids having to retype a long line of code or data.

The PAUSE statement is an attractive new feature of this language. Because the CC-40 displays printed items so quickly that you cannot see them, this statement is very helpful. During a PAUSE, the underlying cursor is displayed in column one and waits for you to acknowledge it by pressing [ENTER] or [CLR]. After either of the keys is pressed, the computer

PRACTICAL TI9/4A SOFTWARE FOR USE IN YOUR HOME

Put your 99/4A to work for you in your home. These programs are written in TI Basic and require only a cassette recorder to run. But don't let the minimum hardware requirement fool you. They are practical programs written to help you do your homework.

STOCK PLOT.....\$19.95

Enter the weekly high, low, and close prices of your favorite stocks and your position in these stocks. The computer files the data. On command it will plot the price history of a stock for the last 50 weeks. Also computes the value, cost, average hold time and average rate of return of your portfolio. Cost may be tax deductible.

NEWSPAPER ROUTE.....\$12.95

Maintains list of customers, amount due from each, and total amount due. Enter charges and payments each collection period. Program is user friendly. Can be used for other small home businesses, such as cosmetic sales. Excellent for gaining experience in practical uses of your 99/4A.

Order by check from:

Software for the Home

951 Lookout Drive
Kingsport, TN 37663

DON'T WAIT TOO LONG To Experience The Excitement Of Assembly Language

Discover what everyone has experienced when they have tried our Assembly Language Program. You will be amazed at the speed and power your 99/4 or 4A can produce from only a cassette and Mini Memory Module.

DEFEND THE CITIES II - An alien ship orbits overhead dropping bombs on the cities. You must destroy the bombs before they reach the skyline and you must destroy the ship to end the attack. Your ship rotates 360° enabling you to fire or accelerate in any direction. Spectacular arcade action, graphics and sound effects.

This is a full 4K Assembly Language Program and requires either MMM, cassette and console or Editor/Assembler, 32K, disk system and console.

"The kind of game you might pump quarters into all day at a commercial arcade."

99'er Magazine, Nov. 82

Cassette \$19.95 Disk \$21.95

DEFEND THE CITIES - Extended BASIC version.

"One of the better games being offered in the arcade category."

99'er Magazine, Nov. 82

Cassette \$19.95

WATCH FOR SUMMER RELEASE OF

THEON RAIDERS

A TOTAL 3-D EXPERIENCE

Visa and Mastercharge accepted

5407 Salem Hill **INTERSOFT** (512) 447-1757
Austin, Texas 78745



PRESENTS: ATLANTIC CITY GAMES

BLACKJACK/SLOT MACHINE
Cassette Software for the TI 99/4A

2 GREAT CASINO GAMES - ON ONE TAPE!

- Programs run in TI BASIC!
- Use keyboard or joysticks!
- High resolution graphics!
- Atlantic City style payoffs!
- Blackjack features doubling, splitting pairs, insurance and is played with 4 decks!
- Practice your betting systems at home!
- Complete instructions included!

BOTH PROGRAMS ONLY \$15

Write for catalog-dealer inquiries welcome.

Send check or money order to:

Jerseyware Microcomputer Software
P. O. Box 482
Fords, New Jersey 08863

resumes execution of the program with the next statement. You may also have the computer pause after a specific statement by following that statement with PAUSE and the number of seconds that the PAUSE is to last.

Multiple prints-per-line to the display are also possible. If the PRINT or DISPLAY statement is followed by a comma or semicolon, a pending print condition is created. If a comma ends the statement, the computer spaces over to the next field. If a semicolon ends the statement, the computer does not space over. Then the following PRINT or DISPLAY statement prints on the same line at the current column position:

```
100 INPUT "Enter Starting Mileage: ";SMILE
110 INPUT "Enter Ending Mileage: ";EMILE
120 INPUT "Enter Gallons Used: ";GALL
130 MPG=(EMILE-SMILE)/GALL
132 IMAGE Miles per gallon: ###.##
134 PRINT
    "Miles=";EMILE-SMILE;
136 PRINT
    "Gallons=";GALL;PAUSE 2.5
140 PRINT USING 132;MPG
150 PAUSE
```

Other than the addition of the PAUSE feature and the pending PRINT and DISPLAY statements, Enhanced BASIC's input and output commands are handled similarly to TI's Extended BASIC cartridge with only minor syntax differences.

Another interesting feature of this language is the ability to test a string for a numeric constant. A user can test the string to determine if it is a valid representation of a numeric constant by using the NUMERIC function. NUMERIC returns a value of minus one (true) if the string is a valid representation of a numeric constant and a value of zero (false) if it is not. NUMERIC can also be used on a string to see if VAL will convert it to a numeric value:

```
160 IF NUMERIC(A$) THEN
    A=VAL(A$) ELSE PRINT "NOT
    A NUMBER":PAUSE
```

Lasting Attachments

The ATTACH and RELEASE statements are also quite useful. You can reduce the execution time of a program that repeatedly calls a subprogram by using the ATTACH statement when you have sufficient memory. The variables are initialized only once when the ATTACH is executed and not each time the subprogram is called. The values of the variables are maintained whenever the subprogram terminates.

To release used memory, use the RELEASE statement. The variables in the subprogram are then initialized each time the subprogram is called and are not maintained when the subprogram terminates.

There is an extensive list of built-in subprograms available to the user. You can, for example, add to the internal memory of the CC-40 by using CALL ADDMEM. This appends the random access memory (RAM) in an installed memory expansion cartridge to resident memory.

Along the Assembly Line

Many of the built-in subprograms were designed to allow the user to work with Assembly Language programs and subprograms. For example, the function FRE is useful for determining a) how much memory is being used for the operating system and the program memory, and b) how much memory is available. The GETMEM subprogram is for reserving the memory that you have determined is available from the FRE function. You can then store data and Assembly Language programs and subprograms there. The RELMEM subprogram releases the memory you reserved with GETMEM. The amount of memory reserved should be significantly less than the largest block available, because sufficient memory space must remain available for statements that require additional temporary memory.

PEEK, POKE, and LOAD are used in a way similar to Extended BASIC's PEEK and LOAD. (Extended BASIC's CALL LOAD actually does the job of both POKE and LOAD.) EXEC is used to execute an Assembly Language program or subprogram. There is also an I/O subprogram to perform control operations on peripheral devices.

Watch Your Language

The language prompt subprogram SETLANG is an interesting feature. It allows a user to set the prompts and messages of many of the Solid State Software cartridges to either the English or a foreign language. The CHAR, KEY and VERSION subprograms are used in much the same way as they are in Extended BASIC. The INDIC subprogram is new. This is needed to control the 17 indicators in the display that a user can turn on and off. There are six indicators at the bottom of the display reserved for users.

Getting Your Act Together

The final two subprograms are extremely useful to the serious programmer. The CLEANUP subprogram allows you to eliminate any variables that are not being used in the current program and memory. CLEANUP cannot, however, be called from a program. The DEBUG subprogram allows access to the DEBUG monitor—allowing users to read and change memory locations, as well as RUN and debug Assembly Language programs and subprograms. The monitor is designed to be used with the CC-40's separate editor-assembler cartridge. This monitor, by the way, contains some very powerful features. For example, a user has the ability to modify the microprocessor's *program counter*, *status register*, and *stack pointer*. There is also a useful *single-step* command built in.

When the tour continues, we'll look at how to use external devices with the CC-40, examine file organization, and work with simple data handling. We'll also present you with some short programs that you can key in and RUN on your Compact Computer.

COMPUTER CONNECTION I

180 day warranty printers
 Gemini 10".....\$375
 Gemini 15".....\$550
 4K Serial board.....\$70

90 day warranty printer
 Microline 83A.....\$775
 Required cable for printers....\$48
 *Rewired for TI 99/4A
 (See TI99'er Feb'83 printer review)

1 year warranty monitor
 Amdek Color I Monitor.....\$290
 Required monitor cable.....\$18

Normal delivery is 1 to 2 weeks for
 cashier check & money orders
 Personal checks are 10 days longer
 Ohio residents add 6.5% Sales tax
 Add 3% shipping charge

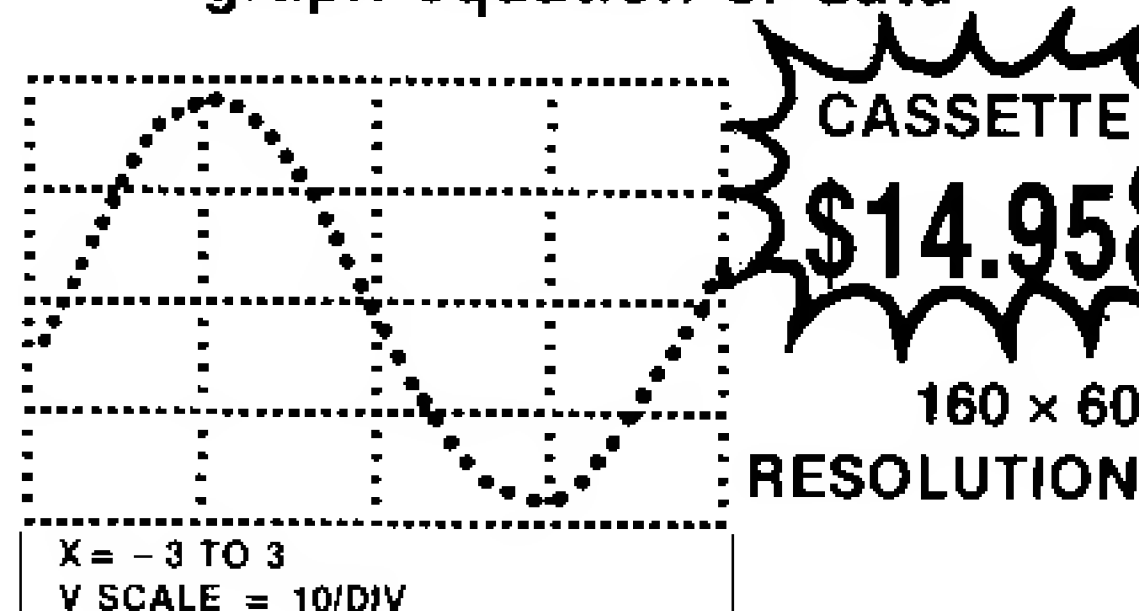
Mail order to:

COMPUTER CONNECTION I
 PO BOX 02453
 Cleveland, Ohio 44102
 (216) 961-7311

**WHAT GOOD IS A COMPUTER
 WITHOUT GOOD GRAPHING??**
 Get **EXPANDED GRAPHING**
 in TI-BASIC for TI 99/4A
 with automatic scaling.

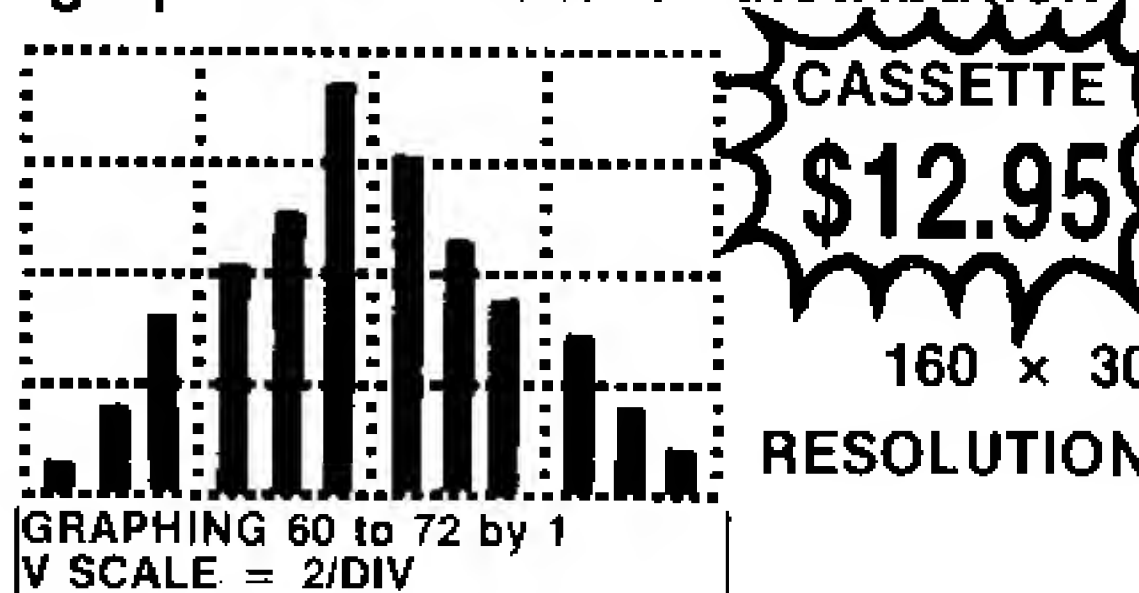
POINT-PLOT PROGRAM

graph equation or data



BAR-PLOT PROGRAM

graph direct data or distribution



SAVE \$3.00 BOTH TAPES \$24.90.
 Send check to: (IL add 6% S.T.)

MICRO CONCEPTS

P.O. BOX 3368
 FOX VALLEY MALL
 AURORA, IL 60505

GRAPHICAL ADVENTURES

Maneuver a graphical adventurer
 around inside a window containing
 graphical and word objects. Type **two-**
word commands. Exit the window
 where possible and a new window will
 quickly assemble. **Color graphics** and
sprites galore. **Save-game** feature
 for M.A. and E.A. All adventures
 come with instructions and a clue
 sheet. For 99/4 and 99/4A.

Medieval Adventure.....\$18.00
Egyptian Adventure.....\$18.00
Sundial Island I & II.....\$24.00

All 3 of the above for \$48.00

Graphical Adventure-all graphics and no text
\$12.00
Haunted Mansion-all text and no graphics
\$12.00

Special Offer

Demonstration Program-See the high
 quality graphics for a low cost...\$4.00

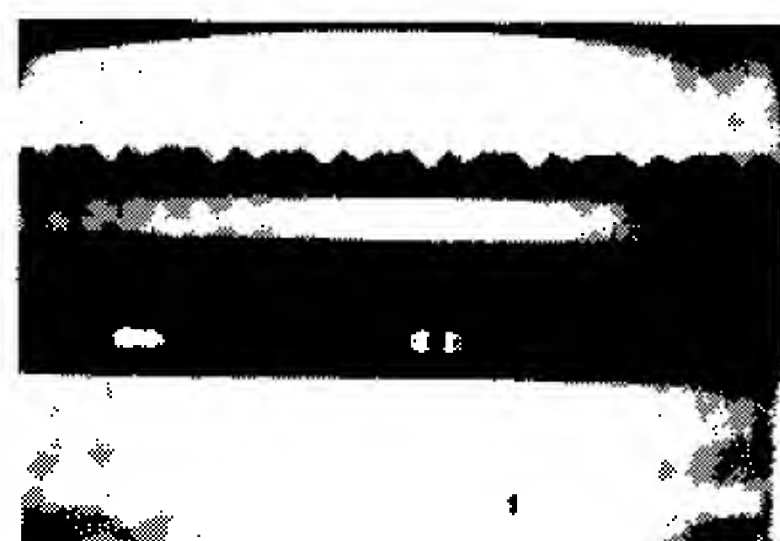
Detailed catalogue available

Extended BASIC required
 Cassette orders only to:

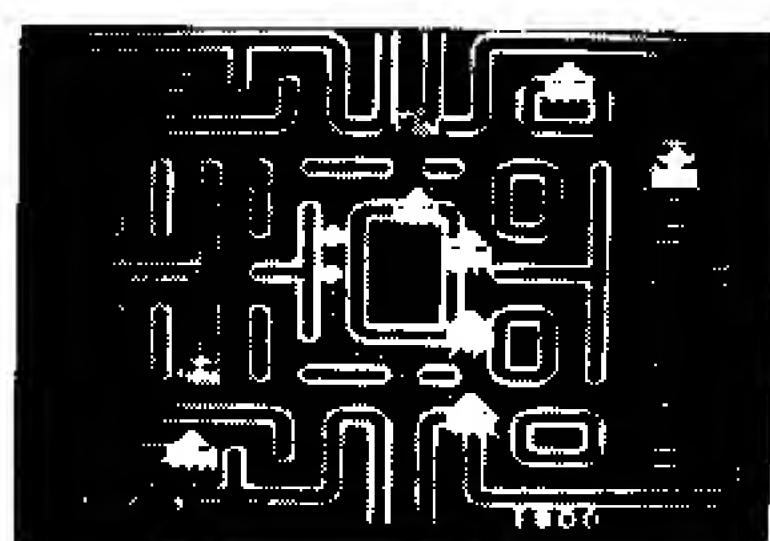
Walter J. Dollard
 417 Woodland Hills
 Pittsburgh, PA 15235

SOFTWARE
NORTON
 software

Ask for our Free Brochure outlining these and many other exciting TI99/4(A) compatible programs.



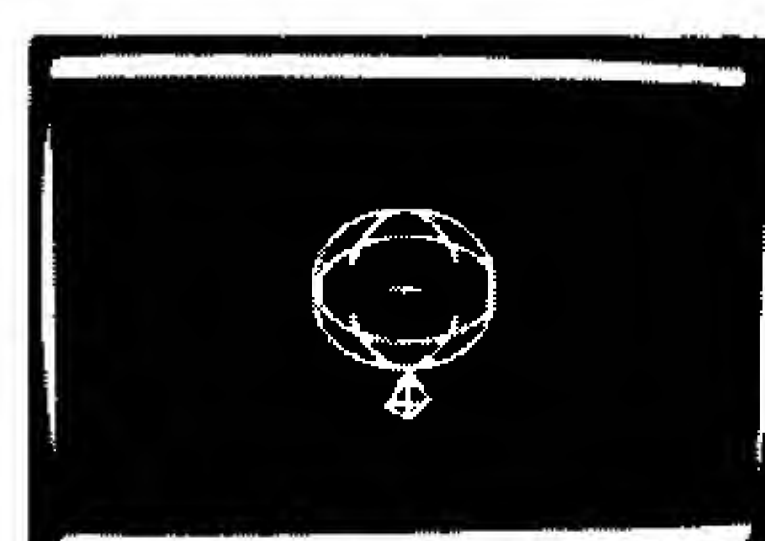
Colorado seems pretty easy.
 But ...
**CROSS COUNTRY
 CAR RALLY** \$19.95



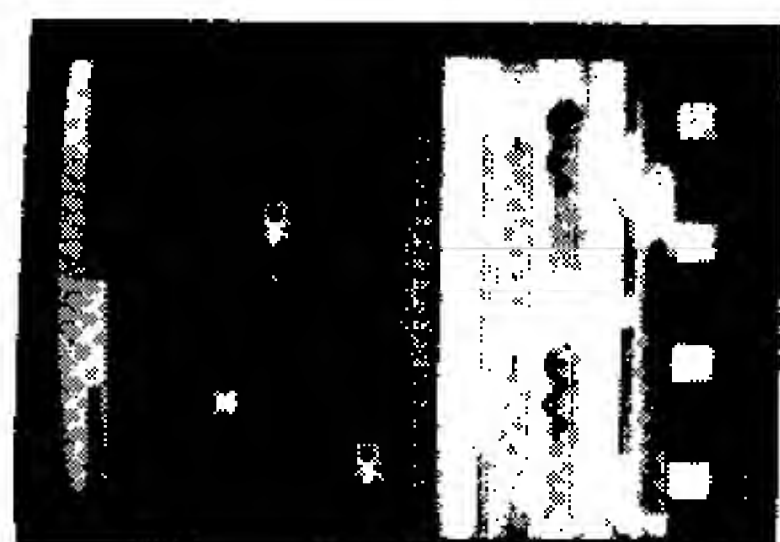
Where are the energy pellets
 when you need them?
ATTACK-MAN \$19.95



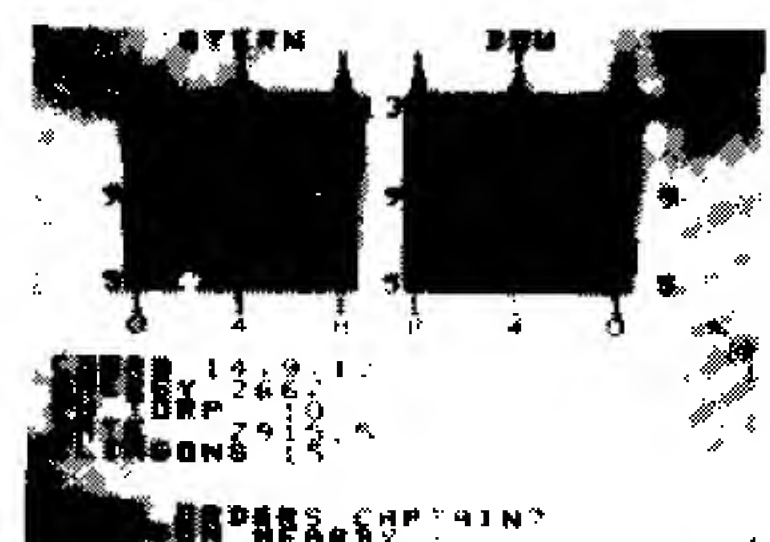
Incorporate music into your own
 programs easily.
MUSIC SYNTHESIZER ... \$19.95



The easy way to draw
 hi-resolution graphics.
GRAPHICS PACKAGE ... \$19.95



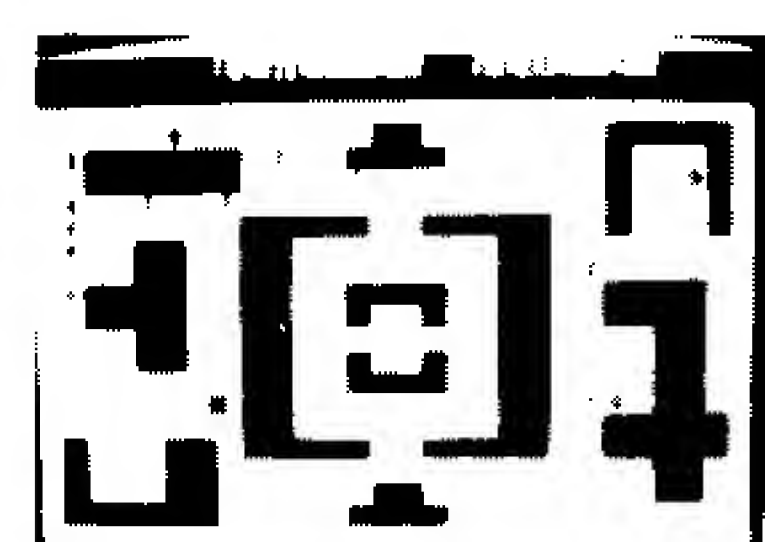
Guaranteed to make you croak!
SUPER FROGGER \$19.95



"This is most illogical captain".
 Save the Federation!
3-D STARTREK \$14.95



Abort, Abort, FCN ... loops!
LUNAR LANDER \$14.95



Take your aggression out on the
 computer or an opponent.
TANK \$14.95

ATTACK-MAN, CROSS COUNTRY CAR RALLY, SUPER FROGGER and GRAPHICS PACKAGE are available only in Extended Basic. All other programs are available in either console or Extended Basic. Joysticks are not needed for any program. You have the option in many programs to use Joysticks or the keyboard. Diskette versions are \$4.00 extra.

Please add \$2.00 shipping for orders
 containing less than 3 programs.
Special offer 20%
 discount for 3 or more programs.

Send cheque, money order or charge number
 and expiry date to:
NORTON SOFTWARE
 Box 575, Picton, Ontario
 K0K 2T0

Save Shipping Charges, many dealers now
 carry the full Norton Software line of products.

DEALER INQUIRIES WELCOME





AUTHORIZED DEALER

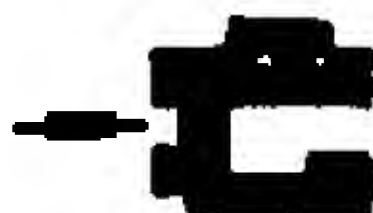
TEX-COMPTM

TI USERS SUPPLY COMPANY
"YOUR LUBBOCK CONNECTION"TM

Proudly Introduces

SUPER JOY STICK II

THE ONLY JOYSTICK THAT CAN CONTROL



THE MUNCH MAN!

RATED #1

August 1982 - Creative Computing

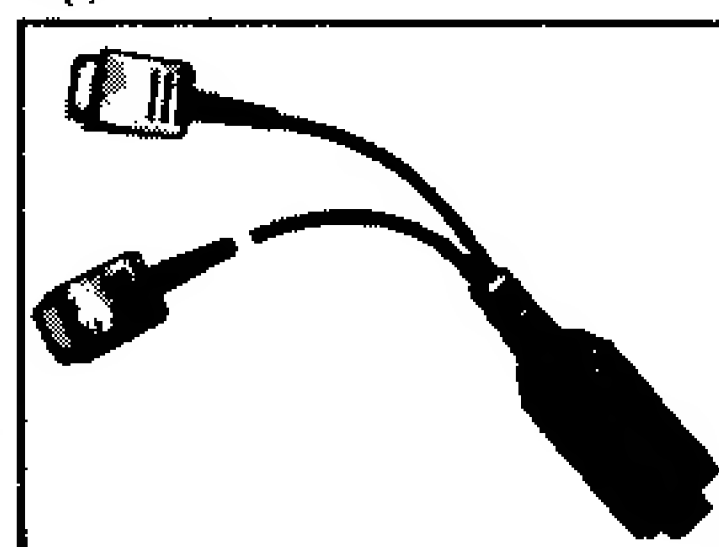
Improved version

The case has been redesigned for easy hand-held operation. The solid steel, short-throw control shaft with an arcade-style ball on the top offers precise, 8-position action. The "soft-touch" fire button is located at the top end of the molded base allowing either right or left-hand play. This improved fire button location is designed to take advantage of the greater dexterity of the index finger resulting in quicker response time and less fatigue during extended play.

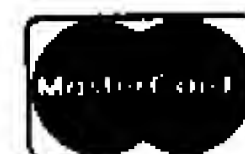
SAME ACTION AS THE REAL ARCADE GAMES

- **SWITCHABLE GATE-PLATETM:** Setting the switchable gate-plate indicator to the 4-way position allows only horizontal or vertical motion dramatically improving response for maze-type games

Helps you make higher levels of Munchman... if you're fast enough.

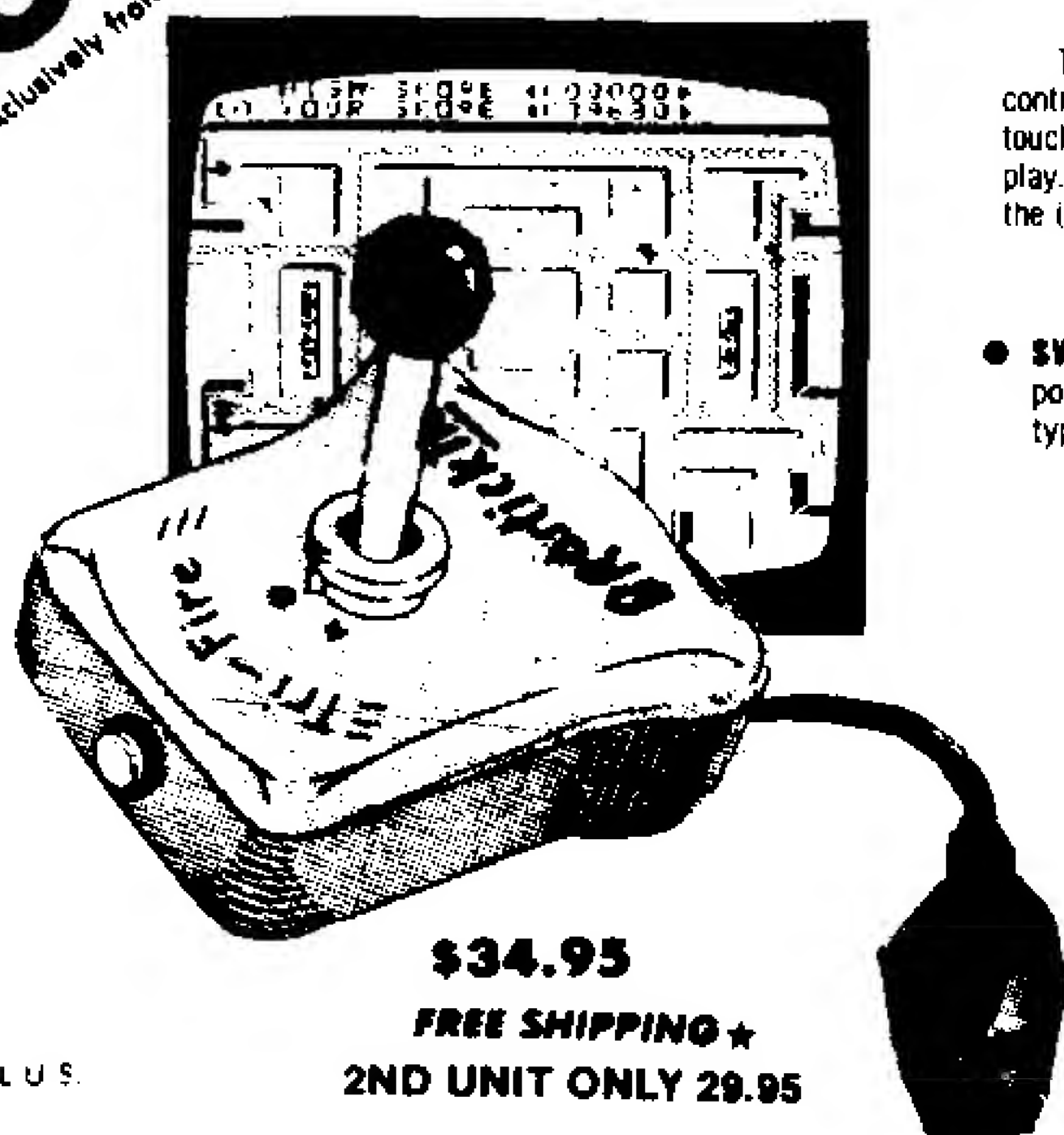


WITH FREE
Port Expander



Add 3% for Visa or MC

new
Available exclusively from TEX-COMP



\$34.95

FREE SHIPPING*

2ND UNIT ONLY 29.95

* CONTINENTAL U.S.

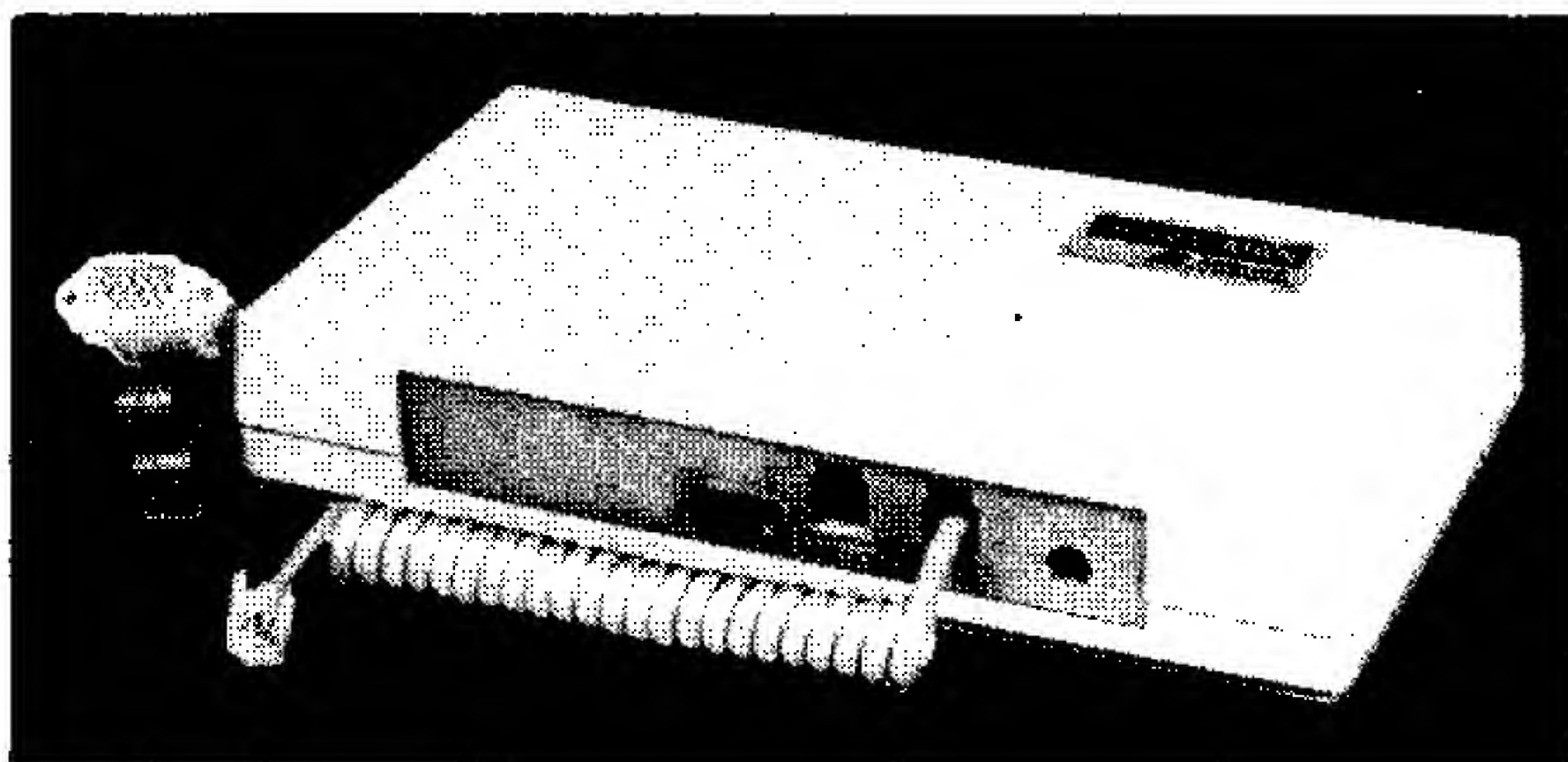
Send Check or Money Order to: **TEX-COMP • P.O. BOX 33084 • GRANADA HILLS, CA. 91344 • (213) 366-6631**

**SEND FOR FREE ORDER KIT AND COMPLETE PRICE LIST
CONTAINS MONEY SAVING SPECIAL OFFERS AND NEW PRODUCT INFORMATION**



TEX-COMPTM

USERS SUPPLY DIVISION



SPECIFICATIONS

Data Format: Serial, binary, asynchronous
Operate Mode: Manual dial, Automatic ANSW/ORG selection
Data Rate: 0 to 300 bps, full duplex
Modulation: Frequency shift-keyed (FSK)
Line Interface: Direct-connect cable to computer
Data Interface: TI RS-232C compatible, built-in cable to computer

	MARK	SPACE	ORIG	ANSW
Transmit Frequency	1270 Hz	2225 Hz	1270 Hz	2025 Hz
Transmit Frequency Accuracy	± 0.01%			

Transmit Level	-12 dBm typical	
Receive Frequency	MARK 2225 Hz	ANSW 1270 Hz
	SPACE 2025 Hz	1070 Hz
Receive Frequency Tolerance	± 0.5%	
Carrier Detect Threshold	-44 dBm typical	
Carrier Detect Indicator	Audible tone	
Power Requirement	Internal 9V transistor battery* or 110 VAC through adapter*	
Size	8 1/4" x 4 3/8" x 1 3/8"	
	*Not included	

Meet the direct-connect SIGNALMAN MARK III designed for use with your TI-99/4A Accessories Interface... the smallest, lightest, most compact modem available today. Its long life 9-volt internal battery and exclusive audible Carrier Detect Signal allow you to install the SIGNALMAN anywhere... out of the way, and out of sight. Now, there's no need for messy cables, and no need to look at a LED to verify carrier.

Anchor Automation has taken the fuss out of communications for business or fun. SIGNALMAN is the ideal modem.

This unit interfaces between the receiver and handpiece of standard Bell modular phones. Phones with dials in the handpiece or without a modular cord between the receiver and handpiece or without a modular cord between the handpiece and receiver, will require an optional adapter.

Comes complete with cable and cord. This is a unit specially designed for the TI-99/4A and should not be confused with other Anchor/Signalman models that sell for less and/or are not compatible with the TI-99/4A.

Send for our free Order Kit — discounts on entire product line

©1982 CALVERT ENGR. INC.

Proudly Introduces
The SIGNALMANTM MARK III
TI 99/4A COMPATIBLE

MODEM

Finally, a low cost, direct connect, high quality and super reliable TI-99/4 and 99/4A compatible modem that comes complete and ready to use — just plug it into a TI RS/232 interface or expansion card.

TEX-COMP PRICE

Limited-Time Introductory Offer

Mfg.

Suggested

List Price

\$139.00

\$94.95

Including shipping & insurance

\$100.00 SPECIAL \$100.00
FREE Source/TEXNET
sign on & first hour
with purchase
of Signalman MK III
Offer Expires 6/83

ACCESSORIES:

9V-DC

Power Supply

\$10.95 p.p.

Mail Check or Money Order to: **Tex-Comp**
P.O. Box 33084, Granada Hills, CA 91344
213-366-6631

VISA/Mastercharge—add 3% for credit card orders. Send Cashiers Check or money order to avoid delay. Calif. orders add 6 1/2% sales tax.



THE BASIC ISSUE AND THE Tortoise's Retort

By Henry Gorman, Jr.

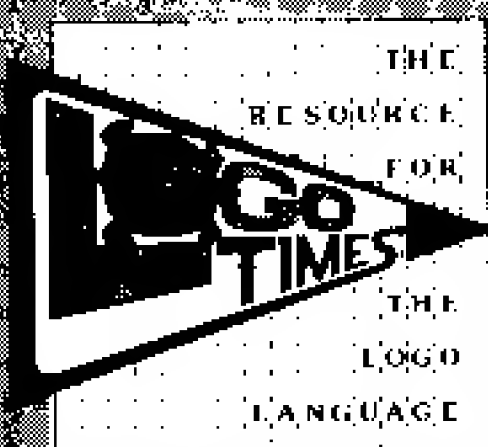
Contributing Editor

We all know the old story . . . the brash young hare taunts the tortoise throughout the race, and then ends up losing—the victim of over-confidence. Well, that age-old competition is being waged once again. But this time, the race is between two computer languages: the popular favorite, BASIC and the slowly-but-steadily-rising LOGO turtle. Is LOGO merely a fabulous graphic language for children, or is it a high-level language capable of holding its own next to the front-running BASIC? While more and more computer users are beginning to realize LOGO's potential, there are still those who underestimate this language. To understand the basis of LOGO's inferior image, let's briefly review the origins of the two languages.

Created Equal

BASIC and LOGO were created at about the same time. The authors of both languages intended their languages to be "friendly," easily learned and usable by computer novices. To accomplish these objectives, the BASIC authors wrote a language which had just a few statements to learn. This tactic had two consequences. First, statements had to be concatenated to gain sufficient computational power. Second, since it had few statements, the language could be implemented on relatively small, inexpensive computers.

In contrast, LOGO's authors created a language rich in statements so that each one was unambiguous and, when possible, similar to the English in meaning. Unfortunately, this meant that LOGO required larger and more sophisticated computers than did BASIC to support it. This difference was hardly trivial back when relatively inexpensive machines cost between \$10,000 and \$100,000, and LOGO-capable computers cost two to ten times as much! Consequently, almost all serious work intended for novices was done with BASIC. Today, it still costs between two and ten times as much to implement LOGO as it does to use BASIC. But a TI LOGO system is only three times the cost of a simple 99/4A BASIC system. As TI continues reducing the price of their hardware while they increase its power, this



Introduction

LOGO Times is an information resource for anyone interested in participating in the creation of their own personal language—one that will easily allow them to communicate with a computer in a totally new audiovisual realm of applied imagination, exploration, and self-discovery. The articles on these pages concern the use of the new TI LOGO language, but readers do not need any additional software or equipment (or even a computer) to understand and learn from the material presented here.

If readers want to actually experience a TI LOGO environment, they will need either a TI 99/4 or TI 99/4A computer, the Expansion Memory peripheral, and TI LOGO Command Cartridge. A disk drive, although convenient to have, is not required; a user's work may alternately be saved on cassette tape, printed out on the TI Thermal Printer, or hand copied into a notebook for later re-keyboarding.

In each issue, one or more of the articles may reference or build upon the topics discussed in a previous article. It is therefore recommended that for maximum benefit and understanding, new readers obtain the appropriate back issues of 99'er Home Computer Magazine containing LOGO Times articles.

NOTICE

LOGO Times is actively soliciting articles. Manuscripts should be typed double-spaced and accompanied by a cassette tape or disk if containing any lengthy procedures or graphics.

Send all materials to:

LOGO Times Editorial Dept.
99'er Home Computer Magazine
1500 Valley River Dr., Suite 250
Eugene, OR 97401

All mail directed to the Letters-to-the-Editor column (Letters on LOGO) will be published in accordance with the conditions set forth on 99'er Home Computer Magazine's Masthead page.

Our Contributing Editors

Henry Gorman, Jr.
Department of Psychology
Austin College
Box 1584
Sherman, TX 75090

Roger B. Kirchner
Department of Mathematics
Carleton College
Northfield, MN 55057

LOGO Times is a trademark of
Emerald Valley Publishing Co.

three-fold difference in cost will become inconsequential.

BASIC in the Lead

BASIC enjoys a 15-year lead over LOGO. The greatest advantage gained by BASIC in this period was not in the large amounts of software developed for BASIC during this time. Rather, BASIC's main advantage has been what S. Papert¹ calls the *qwerty* phenomenon. The *qwerty* effect refers to the resistance people have to improvements in a technology due to their familiarity with older technology. A good example of *qwerty* is our stubborn adherence to the English measuring system.

The insidiousness of *qwerty* can be seen in two examples of reasoning by educators (people who should be the most aware of *qwerty*). I recently spoke with a district curriculum coordinator about using LOGO at his high school which has an enrollment of 2,000. He said that although LOGO was probably the language of the future, the high school already had 10 Apple II's set up to run console BASIC and so they couldn't switch to TI. When I suggested that he add Apple LOGO (although this would cost almost as much as buying complete TI systems), he surprisingly said that they had a good setup and there was no reason to change. My guess is that in the next decade they will expand to at least 200 computers! *Time Magazine* last year quoted another curriculum coordinator who said "Yes, LOGO is a superior language, but you cannot get students jobs in it, so we don't teach it." This educator clearly had a problem understanding education and relevance (how many of his students have jobs in plane geometry or Latin?). His *qwerty* problem was an assumption that things will always remain as they are now. If we have learned nothing else from the electronics revolution, we should have learned that change is a constant.

Why do I think LOGO is a superior language to BASIC? Because LOGO is friendlier, easier to learn, and in most ways, more powerful than BASIC.

The Friendly Tortoise Gains

The term "user friendliness" has been so overused it has become a cliché. Doonesbury pointed out the difficulty novices have using non-friendly computers. Even TI BASIC (a fairly good version of BASIC) is considerably less friendly than LOGO. LOGO is more amiable from its initial message, WELCOME TO TI LOGO! (compared to TI BASIC READY), through to the sign off, AND A PLEASANT DAY TO YOU! (there is nothing in BASIC). The difference in messages may be subtle, but it sets the tone for everything you do with the computer.

Error messages in TI BASIC are not only terse (e.g., CANT DO THAT OR SYNTAX ERROR OR IO ERROR 06) but they are uninformative and often require a translation into English. Is there any sound reason why a user should have to memorize a long series of error code numbers? With TI LOGO you don't have to. Error messages are more in-

formative and stated in English (TELL ME MORE OR OUT OF INK OR X HAS NO VALUE). Thus, finding bugs in LOGO is not an arduous task. Given that debugging represents a major portion of computer programming, this LOGO advantage is significant.

Ease of Learning

The ease or difficulty of learning a language is closely related to its user friendliness. As noted earlier, BASIC was designed to be simple by having very few primitives (built-in instructions). Consequently, it was necessary to give primitives several meanings, depending upon their contexts. The user must, therefore, learn not just the primitives, but their contextual meanings as well. In many cases, the meanings are quite different from their equivalents in spoken English, so that the user must also unlearn that meaning. Consider the =, for example. In English this is read "equals" and is interpreted either as the statement that the left-hand side is equivalent to the right (as $3 \times 2 = 6$) or as an implicit question: "Does the left side equal the right?" In BASIC, LET $X = X + 1$ or $X = X - 1$ have nothing to do with equality; here = should be read as "becomes" as "Let X become X + 1." As soon as this new meaning of = is learned, one finds that in IF $X = 20$ THEN GOTO 140, there is the old implicit question, "Is X equal to 20?" To avoid such ambiguities, the LOGO authors used each primitive uniquely and made that meaning as close as possible to standard English. To test for equality in TI LOGO, one can use either IF $X = 20$ THEN STOP or TEST $X = 20$ /// IF1 STOP. These statements can be read, "If the value of X is equal to 20, then stop." TI LOGO handles the attribution of a value to a name or the changing of a value assigned to a name with either MAKE or CALL (the choice is up to the user). CALL $X = X + 1$ means to assign the value of X plus 1 to the name X. The statement MAKE $X = X + 1$ means "Make the name X have the value of X plus 1." With a few possible exceptions (perhaps HPUT, LPUT, or SENTENCE) in which there are no one- or two-word English equivalents, the TI LOGO authors managed to make the primitives correspond to English. In some cases (CARRY or LOOKLIKE), users are given a choice of primitives.

Turtle Power

There is actually one sense in which BASIC is more powerful than LOGO! Currently, BASIC users can send information from their 99/4A through an RS232 interface to any compatible device (such as a printer). Extended BASIC users can POKE around in the workspace memory, and program music. Mainly for production reasons (and because LOGO was originally thought of as a children's language), TI LOGO can not output to an RS232, allow access to the workspace memory, or program music. (It only makes a "beepy" sound.) These shortcomings will, however, be remedied in TI's LOGO II which will be able to output to an RS232, will allow for user-on-demand garbage collection, and will have full access to music.

Here are two programs which demonstrate the power of LOGO for handling a common problem of information processing. The problems are actually inverses of each other. The first is how to find the largest number in a list of numbers and the second is how to find the smallest number in a list of numbers. The strategy that the two programs (*Biggest* and *Smallest*) use is to take the first number in the target list and assume that it is the biggest (or the smallest) and then to check that number against all other numbers in the list. If a larger number (or smaller) is found, then it is checked against all others in the list until all numbers have been checked.

```

Smallest
TO SMALLCHECK :LIST
IF :SMALLEST & FIRST :LIST
  CALL FIRST :LIST "SMALLEST
IF BUTFIRST :LIST = [ ]
  "SMALLEST
OUTPUT SMALLCHECK
BUTFIRST :LIST
END

```

```

Biggest
TO BIGGEST :LIST
CALL FIRST :LIST "BIGGEST
OUTPUT BIGCHECK BUTFIRST
:LIST
END
TO BIGCHECK :LIST
IF :BIGGEST > FIRST :LIST
  CALL FIRST :LIST
  "BIGGEST
IF BUTFIRST :LIST = [ ]
  OUTPUT :BIGGEST
OUTPUT BIGCHECK
BUTFIRST :LIST
END
TO SMALLEST :LIST
CALL FIRST :LIST
"SMALLEST
OUTPUT SMALLCHECK
BUTFIRST :LIST
END

```

Simplification

In all other senses, LOGO is more powerful than BASIC. The most interesting power advantage of LOGO is in its heuristics, or what Papert calls "powerful ideas." LOGO provides such problem solving devices as solution by simplification, solution by recursion, solution by sub-goals, and solution by better definition of the problem-space (through explicit naming of states and procedures.)

There are some problems which are so complicated that they cannot be readily solved. The LOGO philosophy is to set aside the total problem temporarily and look for the simplest cases of the problem. For example, many students try to set up "shoot" games in which a sprite is aimed and fired at a moving target. If the sprite comes close to the target, some change in the screen occurs. This simple game idea is actually quite elaborate and beyond the programming ability of most of us. An initial strategy would be to begin with a program in which the sprite automatically fires at the target, hits the target, and begins an exciting change in the screen. After this is achieved, an upgraded version might put control of firing the sprite into the hands of a game player. A more elaborate edition then adds a coincidence check gradually increasing the sophistication, and the original project is accomplished in three steps! A nice side-effect of this tactic is that the programmer never feels that the project is completed; even greater elaborations can be added as the project idea grows.

A second type of simplification (one I call the physicist's tactic because so many college physics projects involve simplifying assumptions) is to look for *boundary* conditions of a problem. Boundary conditions are those which occur at problem extremes. For example, the problem of writing a program which determines if a word occurs in a list is very difficult if you

consider all possibilities for words or lists. Extreme cases, however, in which there are no words in the list or when there is no target word, can be quite easily programmed. The slightly more complicated case, in which the target word is the first word in the list, is also easily dealt with. The problem can then be classified as one of these three easily-handled extremes. Simplification is so strongly built into the LOGO primitives and structure that novice LOGO programmers find themselves using it as a tactic without becoming consciously aware of any growth in their problem-solving abilities. BASIC on the other hand, does not lend itself to simplification. For some projects it is possible to put elaborations in BASIC, but this is usually difficult because it requires squeezing lines into the program rather than adding subordinate programs onto the main, executive program.

Recursion

The strategy of solving problems by reapplication of the same program over and over is not even allowed in BASIC. Using the name of a program inside the definition of that program results in a syntax error message in BASIC. For some recursive LOGO programs there are equivalent BASIC interactive programs. For example:

LOGO	BASIC
TO BEEPER	100 REM BASIC
BEEP	BEEPER
	110 CALL SOUND
	(1000,1000,1)
WAIT 60	120 CALL SOUND
	(1,000,19000,1)
NOBEEP	
WAIT 60	
BEEPER	130 GOTO 110
END	

Continued on p. 69



Reach for MICRO-ED!

Over 100
Educational
Programs for

• Texas
Instruments
99/4A

Dealer
Inquiries
Invited

Send for FREE CATALOG

Please Send me your
FREE CATALOG
For TI

Name _____
Address _____
City _____
State _____ Zip _____

Micro-Ed, Inc.
P.O. Box 24156
Minneapolis, MN 55424

You can call
us at
612-926-2292



By S. T. Holl

Qtrs. 327A Yerba Buena Island
San Francisco, CA 94130

Keeping Your Files Organized with a Linked List

Here is a big, wallaby pocket-sized program demonstrating a technique which has been a recurring theme in programming almost since the inception of computer science. This concept, called *linked lists*, is so unnatural on paper that beginners usually have great difficulty grasping it at first. Once they get it, however, the notion becomes so obvious in the context of the computer that they wonder (a) why they didn't see it right off, and (b) why their friends still don't understand it. The pocket program presented here lets you create, modify, and store linked lists on the 99/4A computer. The principal advantage of using this program over pencil and paper list-making is that the computer version will insert or delete lines in the middle of your list. (This program was originally intended to list furniture for a household insurance policy.)



Figure 1

Underground Railroad

The linked list is a simple idea that has been elevated by computer scientists to the status of a major mystery. Imagine a spy network or an underground railroad in which each agent knows only the identities of his predecessor and successor on the path. People (or messages, or computer programs . . .) can traverse such a path only by picking up addresses step by step along the way. So far as the foul conspirators in the network are concerned, they are arranged in a line like the fowl in Figure 1, but geographically they could very well be scattered as in Figure 2.

Table 1 illustrates the computer analog, implemented as in the *Pocket Inventory Program*. Each line of this table is a self-contained *cell*. On the left is the line number or *address*. In the first column is the address of the previous line, next is the line number of the following line; finally, under *Item* is the list entry itself. Beginning at address 2, see if you can follow the list through to the end (that is, back to where you started).

Now you know who is on call to pull the sleigh tonight.

These linked lists are described as *double linked* because, each *cell* has *pointers* in both directions—to both the predecessor and successor. Singly linked lists have pointers in only one direction and are intended to be traversed in one way only. That's perfectly satisfactory for a lot of applications and takes less storage space.

Cellmates

It is customary for linked lists to have *header* and sometimes *footer* cells which store the information differently from the other cells. Their presence puts the top and bottom items of stored information *inside* the list, instead of on the ends, so that

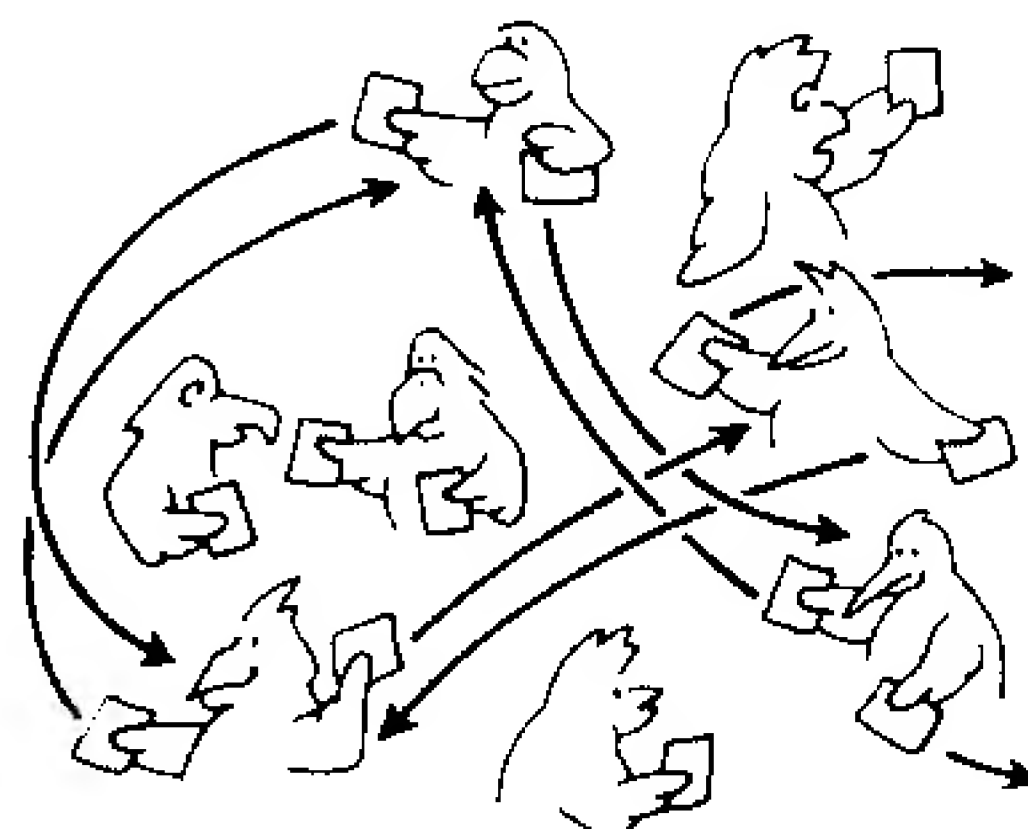


Figure 2

Table 1			
Address			
Previous		Following	Item
0	500	1	
1	0	3	(Pool)
2	10	6	(Header/footer)
3	1	5	Singer
4	6	8	Dancer
5	3	7	Foxhound
6	2	4	Dasher
7	5	9	Rabbit
8	4	10	Donner
9	7	11	Vixen
10	8	2	Blitzen
500	499	0	Rhino

these cells can be deleted (as can all the rest of the cells in the middle of the list). This saves programming. In the *InvList* program a single header/footer cell does the work of both, and the wrap-around gives us the freedom to move easily between the top and bottom of the list.

When the program is first run, it (silently) initiates storage, and then asks "Next task?" The tasks possible are:

S (for *screen*) = display the list, as it presently exists, on the screen.

I (for *insert*) = accept from the keyboard another list item, to go right behind the last one displayed.

D (for *delete*) = delete the last item displayed.

P (for *prior*) = back up and display the item before the last one displayed.

F (for *following*) = go forward and display the next item on the list.

WT (for *write tape*) = write the entire list on tape.

RT (for *read tape*) = read from tape a list previously written with "wt."

Q (for *quit*) = quit.

Variables List:

CELL = an argument in subroutine calls; a frame address.

CUR = a pointer to an entry; an argument in the subroutine calls.

CURINV = pointer to the current entry in the Inventory list.

FOL (follower) = vector of addresses of the following frames in the lists.

INV = top of inventory list

ITEM\$ = vector of string-variable list entries.

POOL = top of list of unused entry frames.

PRIOR = vector of addresses of predecessors of frames in lists.

TASK = what the user wants to do next.

Problems

1. (Introductory exercise): To get the hang of working *InvList* as it appears here, you might begin by listing the names of the seven dwarves as they come to mind. Insert them alphabetically; notice how easy it is to make insertions into the list anywhere you want.

2. (Simple): Change the task symbols to letters which are more meaningful to you. (Would you rather use D for DOWN and then E for ERASE?)

3. (Moderate): Complete task T (tape) for tape or disk, depending on what your system has.

4. (Simple): Fix S (screen) so it pauses after every pageful.

Crime and Punishment

At last a socially responsible game!
Tired of shooting aliens? Like to use your computer to tackle real life problems? Then try CRIME AND PUNISHMENT.

■ You decide on punishments for murderers, robbers, embezzlers, burglars and many more—over 1,000 unique cases.

■ Your sentences are compared to those of actual trial court judges—collected from years of painstaking research.

■ Educational: learn how to make wise decisions—find out what really happens in criminal trials.

■ Fun: Lots of TI graphics and sound. Find out your decision-making I.Q.!

TI BASIC - CASSETTE - \$12.50

Send check or money order to:

Decision-Making Systems Ltd.

P.O. Box 9557, Wilmington, DE. 19809.

Like us to market your software? Send complete description for our careful consideration.

COMPUTER CASSETTES

58¢

FREE TI-Compatible
"Party Trivia Game"
with each order of
20 or more C-10's

- C-10 Length
- 5 Screw Shell
- Lifetime money back guarantee
- Storage Box add 12¢ each
- \$2.00 shipping charge-any quantity
- Send check or money order to

PARALLEL SYSTEMS

Box 772

Blackwood, NJ 08012

609-227-9634

HOME BUDGET

X-BASIC

.RETAINS 12 MONTHS & YTD DATA
ON PROJECTED AND
ACTUAL EXPENSES

.17 USER DEFINED EXPENSE
CATEGORIES

.PROGRAM SUPPLIES:
INCOME CATEGORY
TOTAL EXPENSE CATEGORY
DIFFERENCE CATEGORY
SHOWS NET

.3 SCREENS:
PROJECTED MONTH
PROJECTED VS ACTUAL MONTH
PROJECTED VS ACTUAL YTD

.EASY TO USE PROMPTS
DOCUMENTATION INCLUDED

CASSETTE \$10.00 DISK \$12.50

N.Y. RESIDENTS - 7% SALES TAX

SEND CHECK OR MONEY ORDER

B & B GRAPHICS

92 NOEL DRIVE

WILLIAMSVILLE N.Y. 14221

5. (Simple): Childproof this pocket program, so that it will tell the user when the Pool is exhausted.

6. (Complex): Add a task enabling the user to enter an Item\$ which will then be inserted in alphabetical order (that is, right before the highest Item\$ on the list which is alphabetically after the new entry).

7. (Complex): Add a task permitting the user to alphabetize the Item\$ list with a single command.

8. (Moderate to complex): Add a "value" vector to the program, so that an item's value can be recorded in a numeric field along with its description. Complex extension: Keep a running total value, automatically adjusted as values are added, deleted, or changed.

```

100 REM *****
110 REM * POCKET INVENTORY *
120 REM * LIST PROGRAM *
130 REM *****
140 REM BY S. T. HOLL
150 REM 99'ER VERSION 2.4.1
160 CALL CLEAR
170 PRINT TAB(6); "POCKET INVENTORY"
180 REM
190 REM
200 DIM PRIOR(500), FOL(500), ITEM$(500)
210 FOR I=0 TO 500
220 PRIOR(I)=I-1
230 FOL(I)=I+1
240 NEXT I
250 PRIOR(0)=500
260 FOL(500)=0
270 POOL=1
280 CUR=FOL(POOL)
290 GOSUB 920
300 INV=CELL
310 ITEM$(INV)="HEADER/FOOTER; DON'T DELETE!"
320 FOL(INV)=CELL
330 PRIOR(INV)=CELL
340 CURINV=INV
350 INPUT "NEXT TASK?": TASK$
360 IF TASK$<>"I" THEN 440
370 CUR=FOL(POOL)
380 GOSUB 920
390 INPUT "ITEM?": ITEM$(CELL)
400 CUR=CURINV
410 GOSUB 980
420 CURINV=CUR
430 GOTO 350
440 IF TASK$<>"D" THEN 520
450 IF ITEM$(CURINV)="HEADER/FOOTER; DON'T DELETE!" THEN 520
460 CUR=CURINV
470 CURINV=FOL(CURINV)
480 GOSUB 920
490 CUR=POOL

```

```

500 GOSUB 980
510 DISPLAY ITEM$(CURINV)
520 IF TASK$<>"P" THEN 550
530 CURINV=PRIOR(CURINV)
540 DISPLAY ITEM$(CURINV)
550 IF TASK$<>"F" THEN 580
560 CURINV=FOL(CURINV)
570 DISPLAY ITEM$(CURINV)
580 IF TASK$<>"S" THEN 640
590 CURINV=INV
600 CURINV=FOL(CURINV)
610 DISPLAY ITEM$(CURINV)
620 IF CURINV<>INV THEN 600
630 GOTO 350
640 IF TASK$<>"WT" THEN 760
650 OPEN #1:"CS1", INTERNAL, OUTPUT, FIXED
660 CUR=FOL(INV)
670 PRINT #1: ITEM$(CUR)
680 IF ITEM$(CUR)="HEADER/FOOTER; DON'T DELETE!" THEN 730
690 GOSUB 920
700 CUR=FOL(POOL)
710 GOSUB 980
720 GOTO 660
730 RESTORE #1
740 CLOSE #1
750 GOTO 350
760 IF TASK$<>"RT" THEN 890
770 OPEN #1:"CS1", INTERNAL, INPUT, FIXED
780 INPUT #1: T$
790 IF T$="HEADER/FOOTER; DON'T DELETE!" THEN 860
800 CUR=FOL(POOL)
810 GOSUB 920
820 ITEM$(CELL)=T$
830 CUR=PRIOR(INV)
840 GOSUB 980
850 GOTO 780
860 RESTORE #1
870 CLOSE #1
880 GOTO 350
890 IF TASK$<>"Q" THEN 350
900 STOP
910 REM REMOVE CUR FROM LIST AND PUT IT IN CELL
920 CELL=CUR
930 CUR=FOL(CELL)
940 FOL(PRIOR(CELL))=FOL(CELL)
950 PRIOR(FOL(CELL))=PRIOR(CELL)
960 RETURN
970 REM INSERT "CELL" FOLLOWING CUR
980 PRIOR(CELL)=CUR
990 FOL(CELL)=FOL(CUR)
1000 PRIOR(FOL(CELL))=CELL
1010 FOL(CUR)=CELL
1020 CUR=CELL
1030 RETURN

```

THE BLACK MARKET

A new adult logic game of financial strategy & perilous risks! Can you make a fortune on THE BLACK MARKET, or will you find yourself contending with the Criminal Justice System? You select options from the keyboard or joystick and the computer guides your play. It is easy to learn but the strategy never ends. There is lots of player interaction which makes this the best party game for 2-8 people. You can load odds tables and risk charts from cassette (one of several memory saving techniques used to allow maximum RAM potential of the TI 99/4).

J C L SOFTWARE

4010-I Hwy 6 So. Suite 195
Houston, TX 77082

Console Basic/Cassette \$10.95

Psychometric

An eight part mental health inventory
Measures which psychological areas (below) may need further testing:

- PERSONALITY FACTORS
- LIFESTYLE STRESS
- FEAR
- ANXIETY
- MARRIAGE, FAMILY RELATIONSHIPS
- JOB OR OCCUPATIONAL DEPRESSION
- NON-FAMILY PERSONAL RELATIONSHIPS

Offered only as an aid to individual self-awareness; this program does not provide any psychiatric treatment, is not a substitute for professional psychological counseling, nor is it intended as such.

Available only on cassette,
runs on 99/4 or 99/4A

Program with instructions for
interpretation \$8.95

Send cash, check, or money order. Shipped prepaid anywhere in the U. S. California residents add 6% state sales tax.

Catalogue? Send SASE

Pablo Diablo,

The legendary evil kiteflier

P.O. Box 4863

Santa Clara, CA 95054

SOURCE ID TCV774

WE CHALLENGE YOU TO COMPARE —

☞ Try To Find Any Other Home Computer
That Gives You More For Your Money
Than Texas Instruments . . .

. . . Or Any Other Magazine
That Helps You Benefit More
From a Home Computer Than



☞ **There Are None!**

THAT'S WHY THE EXPERTS SAY:

**Once You Compare —
There's No Comparison™**

SATISFACTION GUARANTEED

Or the Unfilled Portion of Your Subscription
Will Be Refunded

☐ **YES**—Please sign me up as a subscriber. Enclosed
is payment or credit card billing information.

Term	U.S.A.	Canada & Mexico	Foreign Surface	Foreign Air
1-yr (12 issues)	<input type="checkbox"/> \$25	<input type="checkbox"/> \$32	<input type="checkbox"/> \$43	Inquire
2-yr (24 issues)	<input type="checkbox"/> \$45	<input type="checkbox"/> \$52		
3-yr (36 issues)	<input type="checkbox"/> \$63	<input type="checkbox"/> \$70	Sample Issue	<input type="checkbox"/> \$3.95

☐ Check or Money Order enclosed
(MUST BE IN U.S. FUNDS DRAWN ON U.S. BANK)

Name _____ **PLEASE**

Address _____ **PRINT**

City _____ State _____ Zip _____

Bill my: ☐ VISA ☐ Master Card

► Expiration Date _____

Signature _____

Charge Card Number:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Please Mail Your Order To: **99'er Home Computer Magazine**
P. O. Box 5537
Eugene, OR 97405

Credit card phone order call:
Tel. (503) 485-8796 **WEST COAST TIME**
Business Hours: 8:00 AM - 5:00 PM

Finding the best deal in a Home Computer isn't the whole story. You also need a timely information resource to help you get the maximum value out of your purchase. And that's where *99'er Home Computer Magazine* fits in.

As the **ONLY** magazine exclusively for the Texas Instruments brand of home, personal and portable computers—including the versatile 16-bit TI-99/4A Home Computer, the TI-99/2 Basic Computer, and the battery-powered Compact Computer series—*99'er Home Computer Magazine* is a **MUST** for all current users interested in entertainment, education, business, professional, and home applications. Also, it is an essential evaluation resource for those who want to know more about the friendly, value-packed TI computers in order to make intelligent purchase decisions in the future.

A Unique Combination of Resources

As a bonus, *99'er Home Computer Magazine* contains several special-interest supplement **LOGO Times**—a journey of applied imagination, exploration, and self-discovery through the TI LOGO language environment; **Computer Gaming**—a treasure-trove of fun, excitement, and strategy; **Portable Computing**—an applications compendium for transportable computing power; and **PLATO Progress**—a valuable users guide to an extensive computer-assisted learning library.

A Multi-Level Teacher, News Medium, & Buyer's Guide

With Lots of FREE Software

Each BIG monthly issue of *99'er Home Computer Magazine* contains tutorials and applications for beginners, tips and "How-To" articles for intermediate-level users, advanced programming techniques that keep the pros coming back for more, as well as half a dozen ready-to-run computer programs for **EVERYONE**. Additionally, there are photos and news items from shows where TI exhibits its products; advertisements from the leading producers and vendors of TI and TI-compatible software, hardware, and accessories; plus in-depth descriptions and reviews of the latest products and books—timely information to keep readers well informed and help them make wise purchase decisions.



... From The People Who Know The Home Computer Best

FULFILLING UNTAPPED POTENTIAL

By Sam L. Jenkins

907 6th Ave. East
Menomonie, WI 54751

Many educators have already discovered that something very special happens when they put mentally handicapped children or adults and computers together. As a developer of software for the mentally handicapped, I was pleased to notice that using the computer gave them a new feeling of strength and power with which to tackle learning about their environment. The computer seems to have the ability to focus the learners' attention on the cues that are crucial to performing a learning task. The feeling of success that this creates is a strong motivating factor in the learning process for everyone, but it is especially important for handicapped learners.

IQ and Performance

To look a little deeper into what makes the computer and the mentally handicapped learner such a good team, I supervised a modest research study conducted by a graduate student at the University of Wisconsin-Stout. Our hypothesis stated that there was no relationship between IQ and the ability to perform one step interactions on a computer. We conducted our tests at Indianhead Enterprises, a center for the developmentally disabled in Menomonie, Wisconsin. Using my TI and a program I developed, we asked each of the thirty participants to follow a model of the keyboard on the screen in order to learn key positions. Keys flashed on and off at random and the computer's Speech Synthesizer told the user which key to press. The computer automatically tallied the student's responses for later analysis. Meanwhile, the students got immediate feedback with an audible RIGHT or a NO, TRY AGAIN with each response.

We selected five people for a brief pilot study to iron out procedural difficulties. Following that, we tested the twenty-five members of the sample in individual five-minute sessions. The computer recorded correct responses and calculated the percentage correct of the total number of key presses. These scores ranged from 0 to 100%. In some instances, students with higher IQ's did not do as well as some with lower ones. The correlation between IQ and performance on the research task was not significant.

Results

While the statistical findings of the study are not of great significance, the *practical* applications are important. First and most important, persons classified by IQ tests as mentally retarded showed us that they

could interact with a computer. Second, we found other factors that seem to contribute to a successful computer performance: the ability to follow visual and auditory cues and integrate them. Also, we explored how the knowledge of alphabetical and numerical characters influenced performance on computer drills. Since each participant was asked at the outset of the exercise to record letters and numbers, we could observe who demonstrated this skill. The results showed that three of the seven persons who performed at 87% or above on the computer exercise could record neither numbers, nor more than half the letters of the alphabet. We concluded that a knowledge of the keyboard characters did not assure a better performance on the computer exercise.

Our overall interpretation of the results is that IQ measures alone are not adequate in judging a retarded student's ability to profit from a computer assisted instruction program.

Further Research

We are currently finishing a follow-up study on training and computer use. In our first study, when we encountered someone who did not grasp the exercise, our first question was "Would this person be able to do this with additional training?" The same participants were allowed to practice the exercise for fifteen minutes with additional prompting and assistance from the researcher. Then we readministered the tests and in many cases performances improved. Clinical observations suggest that simple verbal prompts and encouragement from a trainer greatly aid the student in learning the key strokes. This is consistent with our general experience in working with the mentally retarded on computer exercises. Simple common-sense assistance can be extremely helpful to any learner.

There are several benefits of computer assisted instruction with the retarded. Most important, learning becomes fun. The facial expressions and verbal remarks we observed suggested that the students were enjoying the activity. Learners seem to be motivated by the sights and sounds of

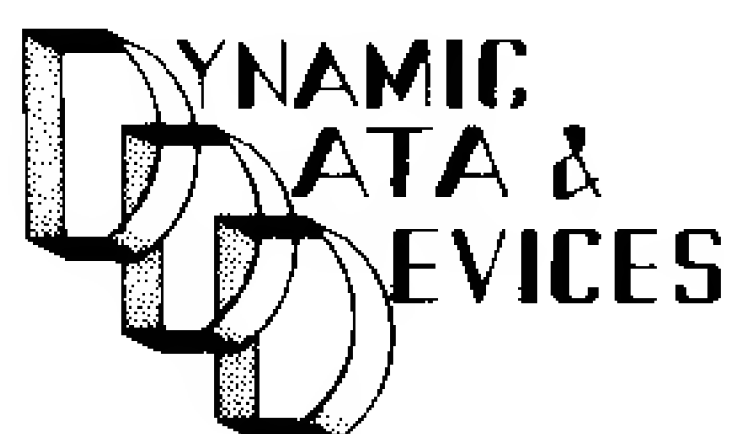
computer exercises. From such motivation comes increased attention spans. Frequently it is difficult to coax the students from their keyboards. Also, a strong spirit of competition is apparent in their approach to the activity. Repetition affords them the opportunity to "beat the machine" or to "win the game."

This, in my understanding, is using the computer to its fullest advantage. For the nonreader, I find that the programming features of the Texas Instruments computer meet the challenge to provide a multisensory instruction format. The programs that I have written use the graphic, sound, and speech capabilities of the TI to teach basic counting skills, arithmetic,

Continued on p. 69



TI-99/4



TI-99/4A

DIRECT WRITER II

The "Customer Designed" Word Processor with
MORE FEATURES PER DOLLAR THAN ANY OTHER!!!!

 Mix text sizes within a line on many dot matrix printers. 32 to 132 characters/line. "LIVE" editing. Faster Cursor. UNDERLINING. Displayed, storable tabulation markers. Auto-centering. Right Justify. Left Margin. And with Grafrax Plus: Superscript Subscript *Italics Dble. Strike*

Plus much, much more!

Also excellent for use with "daisy-wheel" printers.

Requires Ex. BASIC, Mem. Expansion, Disk drive (1 minimum) Complete with 60 page instruction manual **\$66**

DIRECT WRITER Original version **\$48**

Quimbee The Exciting Dice Game **\$20**

The Scheduler CPM Project Method **\$38**

Energy Conservation — Residential Heating
 Cost study program to SAVE you DOLLARS **\$28**

Learning Morse Code & Programmable Morse Code Practice
 Two programs for easy, effective code study **\$22**

For Purchases Mail Check Or Money Order To:

Dynamic Data & Devices

P.O. Box 912

Stafford, Texas 77477

(713) 343-0033

Add \$2.00 for postage and handling

SEND FOR FREE CATALOG OR INQUIRE AT YOUR LOCAL DEALER

ATTENTION PROGRAMMERS!!

DATASOFT is currently seeking programs and programmers to add to their rapidly growing and expanding operation. A leading marketer and developer of personal computer software, DATASOFT offers experienced assembly-language programmers the opportunity to join their staff to develop and translate arcade games such as ZAXXON™, as well as to author original material for their games, education and home management product lines. DATASOFT pays competitive salaries, plus bonuses based on product performance. Relocation assistance is available, if needed.

If you have working knowledge of Atari, Apple, TI, or Commodore operating systems, graphics, animation and sound, call or write Melinda Storch at:

Datasoft Inc.®
 COMPUTER SOFTWARE

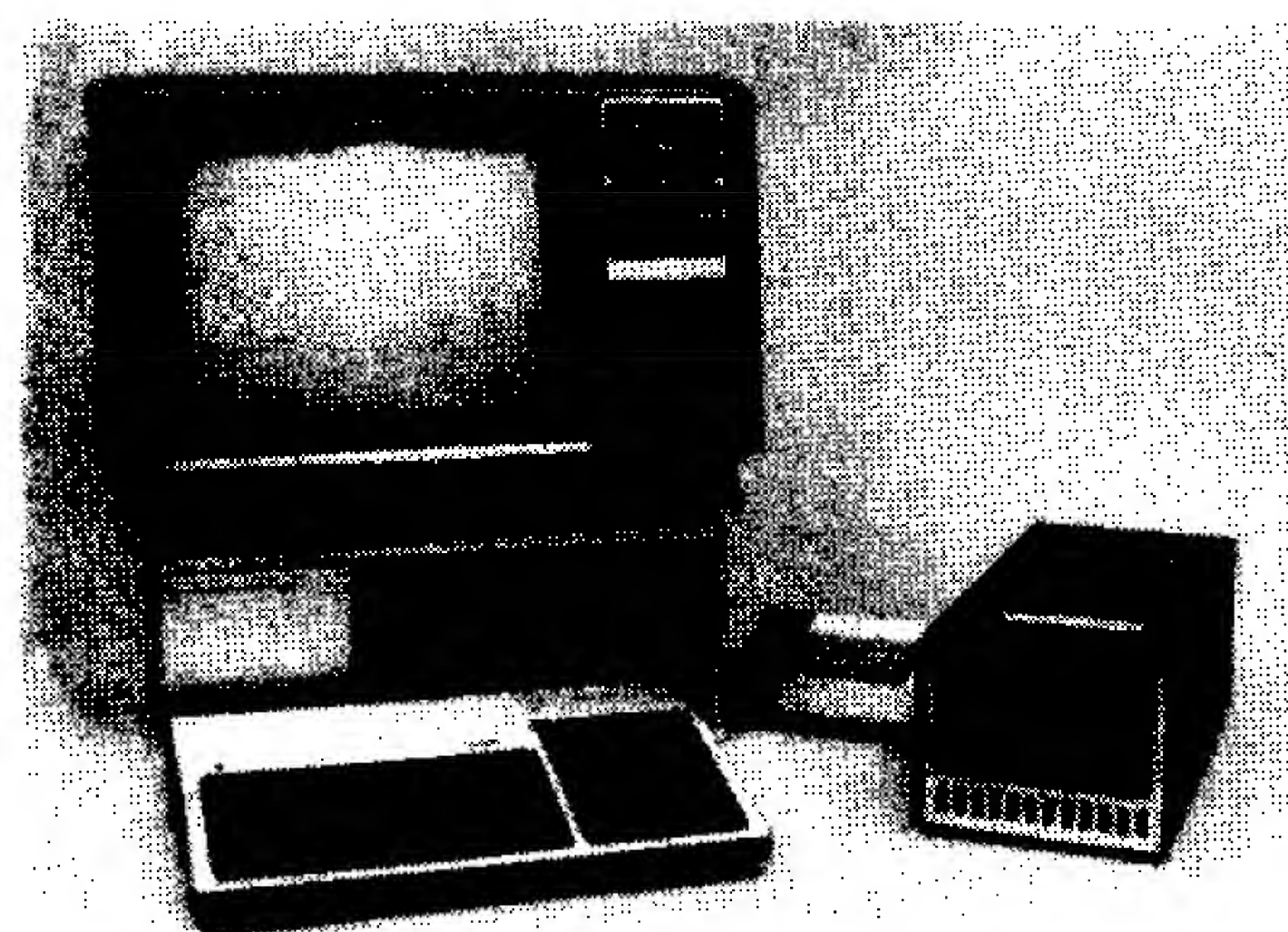
9421 Winnetka Ave.
 Chatsworth, CA 91311
 (213) 701-5161 / (800) 423-5916

ZAXXON and SEGA are registered trademarks of Sega Enterprises.
 DATASOFT is a registered trademark of Datasoft, Inc.

RELIABLE MASS STORAGE FOR THE TI99/4? YOU BET!!

Field tested, MYARC's Winchester Disk and Controller System, the WDS/100 is custom engineered for reliability, ease of use and total upward compatibility from your floppy disk system. UNIX*-like file management is built into its Disk Operating System to accommodate the simplest to the most complex file processing requirements. Start up diagnostics, state-of-the-art error correction coding and rigorous factory burn-in ensure data integrity and hardware reliability. Sealed disk drive eliminates costly preventative maintenance. TURN YOUR 99/4 INTO A TRUE DATA STORAGE SYSTEM!

*UNIX is a trademark of Bell Laboratories.



MYARC's Winchester Disk For The 99/4

\$2599 — 5-Megabyte Model

\$2999 — 10-Megabyte Model

CLOCK OPTION AVAILABLE

AVAILABLE NOW

MYARC, INC.
 P.O. Box 140
 Basking Ridge, N.J. 07920
 (201) 766-1700

As you use cassette tape to load and store programs and data to and from your Home Computer, you may begin to wonder if there isn't a better way. Tired of waiting the 2-3 minutes it takes before you can play your favorite game or run that bowling league handicap update? Well, cheer up! There is indeed a better way. You can go disk!

With disk drives attached to your computer, you can do all the things that you now do with tape, in a fraction of the time. Imagine loading long programs in 5-6 seconds instead of 1-2 minutes! In addition, TI's Disk Operating System (DOS) allows certain advantages you cannot get with cassette tape files. But before we get into the details of DOS and files, let's look at the hardware.

The Diskette

The hardware needed to use diskettes is more complex than the cassette tape recorders you may be used to. The 5¼" diskette used with the TI-99/4A is a circular piece of flexible mylar plastic with a large hole (for the *drive hub*) in the center. A magnetic material is bonded to the plastic on both sides. To protect the diskette from dirt, dust, and fingerprints, as well as accidental creases and bends, it is necessary to house it inside a semi-rigid plastic jacket. Always use a soft felt marker when writing on the labels attached to a diskette jacket. A ball-point pen or sharp pencil could score the floppy diskette inside, rendering it useless.

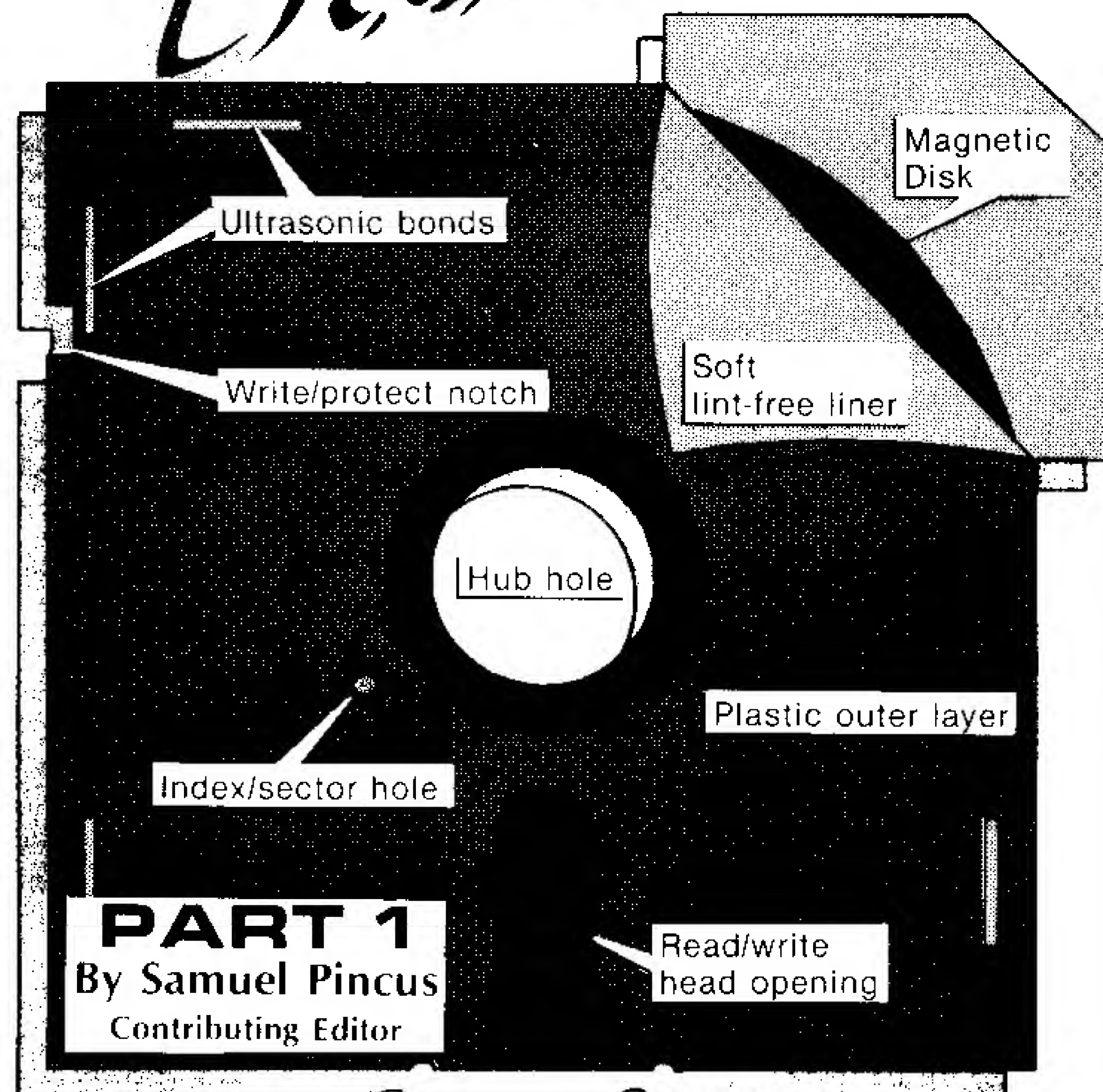
The unit that "reads" the information from the diskette is called the disk drive. Because information is stored magnetically on the diskette, a disk read/write head (similar to a tape recorder head) in the disk drive must touch the diskette's surface. In order to allow the read/write head to make contact with the diskette inside, there is a large oval cut-out on each side of the jacket. In addition, there is a small round hole in the jacket, called the *index hole* and a square notch at one edge, the *write-protect notch*.

If this notch is uncovered, you can read from and write to a diskette. If there is tape covering it, the disk drive cannot write to the diskette. This prevents you from accidentally erasing important data. Each diskette you buy comes with a strip of adhesive tape to cover the notch. It is important, when affixing a label, to make sure that it doesn't cover the write-protect notch!

The illustration shows a floppy diskette with its plastic jacket. The arrangement is a little bit like a 45 RPM record, except that information is recorded magnetically and doesn't need grooves.

You may have read about something called a dual-sided diskette. This is one

Drive for Diskettes



that you can turn over to use both sides with a single-sided drive. The only difference between single-sided and dual-sided diskettes is that the index hole and write-protect notches are missing on the back side of the former. In addition, a single-sided diskette manufacturer won't guarantee that the back side is flawless.

Disk Drive

Just as the 45 rpm record needs a record player to make it work, the floppy disk needs a disk drive. After the diskette is placed inside the disk drive and the drive door is closed, a spindle hub inside the diskette hole spins it around very quickly (at about 300 RPM). A magnetic read/write head moves in towards the hub or outward towards the edge. The combination of the spinning and head movements allows data to be placed on almost any part of the diskette. Data is written onto the diskette or read from it as it spins around inside the disk drive. The characters are stored as a series of magnetic pulses, treated as zeroes and ones, called bits. Each grouping of 8 bits is called a byte and represents a unit of data—either a single character (letter) or a part of a number.

All disk drives have a light in the front that will glow when the drive is in use. When that light is on, you must never open the door to the disk drive. Some drives have locks that prevent the door from opening when the light is on.

There are also *flippy* disk drives which can use either side of the diskette even without extra holes. In effect, they have two sets of index hole and write-protect notch sensors. In any case, you have to take the diskette out and flip it over before you can use the back side.

Some disk drives are double-sided. This means that they have two of everything (including read/write heads) and can read from or write to both sides of the diskette without flipping it over.

In addition, you may have heard of *double-density* disk drives. These are not the same as double-sided drives. Each track of a double-density disk drive can hold twice the usual number of bytes. This will give you twice the room for data on a single side. In effect, this is like having two diskettes simultaneously mounted inside one drive. Because the data is so closely packed together with these drives, some firms manufacture *double-density* diskettes which are guaranteed to handle this density. [Note that most disk drives on the market can work with either single- or double-density systems—Ed.]

For the TI-99/4A system, the *single-density* disk drives are all you need. If you decide to buy a non-TI disk drive, you must remember that they come in two styles. The first style is called *bare*. It does not include a power supply (power cord or transformer) or cabinet. This is the kind of drive you'll need if you are going to install it inside the Peripheral Expansion System (PES). For those of you who choose not to go the PES route, or want to add a second (or third) disk drive, this style of drive can't work. You will need a regular drive which includes the power supply and cabinet. Make sure you know what kind of disk drive you are ordering if you do it through mail order or magazine ads. There is usually a \$50-\$60 difference in price, so what may look like a bargain regular drive may really be a quote for a *bare* drive.

Tracks

The data is read or written on concentric bands called *tracks*. Some disk drives can only utilize 35 tracks of data per diskette; others can handle 40 or more. The 99/4A DOS is capable of interfacing with either 35 or 40 track disk drives. All good quality diskettes will handle 40 tracks. This capacity actually depends on the disk drive, rather than the diskette.

You may wonder, "With the diskette spinning around so fast, how does a disk drive know where to find the starting and stopping points within a track?". The answer lies in the index hole mentioned earlier. Both sides of the plastic jacket and

HARVEY'S SPECIAL OF THE MONTH

A UNIVERSAL TRAINEE TESTING PROGRAM. For use by Training Instructors. Questions & answers may be up to 110 characters each. Maximum capacity is 50 questions, 50 answers. Data statements are used to hold the questions. That means you can save the test by saving the program. Answers from Trainees are stored in an array from Input statements. Instructor options include: Questions review, give the test, grade the answers, get score, print the answers and end program. Trainee options include bypassing, then returning to hard questions, review all questions and answers, answer replacement, and ending the test. The Instructor options are password protected to prevent problems. User instructions explain the program thoroughly. Program runs in T I Basic for /4, or /4A cassette system owners. Thermal printer is optional. Price: Normally \$35, but while on special: \$31.50. For that you get the program on cassette tape, instructions, and free delivery in the U.S.

THE INFORMATION UTILITY PROGRAM. Program will manage a disk containing up to 800 characters of information on each of up to 100 items. Use as many disks as needed. Each of the 100 items are easy to get to and information may be displayed, added, changed, or deleted, as necessary. Fast response to user options, as no disk searches are necessary. The program runs in T I Basic on a minimal /4, or /4A disk system. No printer options. Information goes to the monitor. You get the program on cassette, instructions and free delivery in the U.S. Usually \$30, while on special: \$27.

Price special ends June 15th. Send me a Bank, or Postal Money Order, and I will ship right away by Priority Mail. Deduct \$10 if you want both programs on the same tape, or disk. Add \$10 if you want the program(s) shipped on a floppy disk. No sales outside the U.S. Call for free catalog of other items: 1-803-576-7245, or write to:

JAMES HARVEY
159 Dover Rd.
Spartanburg, S. C. 29301

Delivery and satisfaction is guaranteed, so buy with complete confidence.

SA2 SOFTWARE

FINANCIAL PROGRAMS FOR THE TI99/4A

WANT MORE THAN GAMES ON YOUR COMPUTER? TRY THESE PRACTICAL, LOW-COST PROGRAMS. BOTH USE SCREEN-MENU FORMAT, ALLOW USER ACCESS, AND HAVE DETAILED INSTRUCTIONS.

** MONTHLY BUDGET MASTER **

CREATE UP TO 30 BUDGET ACCOUNTS OR USE BUILT-IN FORMAT. RAPID DATA ENTRY AND EDITING. SAVE AND RETRIEVE DATA FILES. OUTPUT RESULTS TO SCREEN OR A PRINTER.

** INCOME TAX PLANNER **

DON'T BE CAUGHT BY SURPRISE NEXT APRIL! FORECAST NEXT YEARS TAX BILL AND AVOID OVER OR UNDER WITHHOLDING. DATA CAN BE REVISED & RESAVED AS ESTIMATES CHANGE.

SPECIFY TI OR X-BASIC, CASSETTE OR DISK
\$12 EACH OR \$18 FOR BOTH (DISK ADD \$2)

SEND CHECK OR MONEY ORDER TO:

SA2 SOFTWARE
P.O. BOX 2465
NAPERVILLE IL 60565

the floppy diskette have this index hole. When the three holes are lined up, you can see right through the disk. In the disk drive, a beam of light is aimed at the holes and will pass through them only when they are lined up. The light beam then strikes a photo receptor which tells the drive that it is at the start of a track. As the diskette continues to rotate, the holes will no longer line up; the disk drive electronics will read (or write) the data from that track and pass the results to the computer.

Sectors

Each track on a diskette is usually broken down into equal-sized areas called *sectors*. There can be as few as 8 or as many as 16 sectors on a diskette. The number chosen depends on both the hardware and DOS. In a *hard sectored* diskette, this is all hardware controlled. Only a computer geared for this particular number of sectors can use this disk drive and floppy diskette combination. In a *soft sectored* diskette (the type used by the 99/4A) the number of sectors is chosen and controlled by the DOS. With this kind of system, the same disk drive may be used by different computers. For example, the disk drive that I currently use in my TI will also work in a Radio Shack computer.

The TI-99/4A uses 9 sectors per track. With a 40 track drive, that gives 360 sectors of data. Each sector holds up to 255 bytes (or characters) of information. This gives a total of 255×360 or about 90,000 (called 90K) bytes of storage on a single disk. The important thing to remember, however, is that a sector holds exactly 255 bytes and that any information to be written on to, or read from a diskette will have to be in "chunks" of 255 bytes or less.

When you go shopping for drives, it is important to ask about *track-to-track access time*. This tells how long it takes for the read/write head to move from one track to another. In order to function correctly with a particular com-



DESK TOP COMPUTER STAND

Only \$2500
plus Ship/Hndlg by
TIME ZONES:
\$7.00 Eastern &
Central (\$32 TTL)
\$13.00 Mtn. & Pacific (\$38 TTL)

Room for 13" TV, Exp. Box on top & Console under.
Stores 50 cssts/mdls/books/manuals inside storage area.
Sturdy const., stained, polyurethane finish, etc. Apprx.
35 lbs. Allow 2-4 wks. delivery

Dust Covers in brown fabric-backed vinyl, cut-out for cables, etc.
• For 99/4A — 11 x 18, covers synthesizer @ \$7.95
• For Csst. Recdr. — 11 x 6 @ \$4.95
• ++ Shp/hndlg: \$2.00 first cvr. + .50 each addtl.

Custom Programming Services
Other Computer Related Products
Printing Services
Business & Personal Data Processing Services
(call or write for information)

Send Check To:
CompServ — Bill Duffy
812 Duffy Court, Matthews, NC 28105, (704) 847-0965.

puter, a disk drive must not take longer than a specified amount of time to move to the next track. If it does, the computer will think that something went wrong and stop the drive with an error message. Before you buy a disk drive, make sure that it is fast enough to keep up with your 99/4A. You will need something with about an 18 millisecond or less access time.

Controller

Although many people talk as if disk drives can run themselves, all of these machines require a special hardware controller to make them act in accordance with the computer manufacturer's hardware and DOS. Not only must you buy a disk drive, you must also buy a disk controller to run it. A single controller is capable of handling all three disk drives (called DSK1, DSK2, and DSK3) that you can attach to your 99/4A computer.

The controller locates the proper disk drive and tells it what you want. It will receive the data bits from the drive one at a time and build them into bytes which it feeds into the 99/4A (or vice-versa). It also contains the program code for some of the various functions that you give it. The controller literally takes control of the computer as it tries to access your disk. In fact, it does take control of about 2000 bytes of RAM (computer memory) in order to hold the data being written or read. Disk drive controllers are different for each computer. Only a TI disk controller will work on your machine.

In addition to the controller, you will need a special 34-pin connecting cable which comes included with each TI disk drive or can be bought at many computer or electronic stores. This cable attaches the disk drives to the controller. Don't worry too much about the hook-up. TI cables have notches in them so that you can't put them in backwards. If you buy a non-TI cable and you do hook it up wrong, it will be pretty

VID-COM VID-COM VID-COM VID-COM VID-COM VID-COM VID-COM

VID-COM

1018 E. Philadelphia Street, York, PA 17403



REMEMBER.



VID-COM VID-COM VID-COM VID-COM VID-COM VID-COM VID-COM

X-BASIC DISK UTILITY 4.0 BASIC DISK UTILITY 2.0 Full documentation included
These programs will catalog your disks and provide diskname, available and used sectors, filename, length, type and protection information. In addition, version 4.0 will run itself and any X-basic program with the touch of a key.
Disk Only Order #2020 Disk Both Programs Only \$24.95

SPEAK & FILE Basic, T.E.H. and Speech Synthesizer required Full documentation included
What will your computer say next? Your computer can say any word you can type in on the keyboard! This program will allow speech with control of pitch, slope, primary and secondary stress, and delay utilizing the T.E.H. module protocols. In addition, you can create custom files that can be saved, recalled at your instruction, and also be used with your basic programs.
Order #2050 Disk #2050 Cassette \$14.95

X-BASIC GEOSAT LOCATOR I, X-BASIC GEOSAT LOCATOR II Full documentation included
Proven in the field on earth station installations, these two programs provide a wealth of information concerning geostationary satellite bearings and proper antenna alignment. Some features include: Azimuth, elevation, distance, magnetic deviation, polar offset correction and specific information on polar and conventional mount alignment. Includes routine to print out corrected look angles for the standard satellite belt.
Order #2060 Disk #2060 Cassette Both Programs Only \$24.95

GHOST WRITER Basic
Just supply ghost writer with a few choice words and away it goes. Four totally different stories will be created and the results can be amazingly funny. The same words can be used again and again, while ghost writer changes each and every story. If you desire, you can save any story for future use. The only option required is a sense of humor.
Order #2070 Disk #2070 Cassette \$14.95

X-BASIC DIRECTORY 4.0 Full documentation included
This easy to use program will allow you to build custom phone directories. By including simple additional circuitry (can auto-dial tones) any number with the touch of a key. Some of the features include: Auto-dial on-off, full editing (by index or entry), call log with timer, redial, date and a separate area for access codes.
Order #2030 Disk #2030 Cassette \$14.95

X-BASIC COLOR BARS Speech Synthesizer optional (Remember to specify custom logo if desired) Full documentation included
Tired of always adjusting your monitor? Want to check the performance of your video display or VCR? Experts know how useful color bars can be, so can you. These NTSC type color bars also include an audio test (1 to 15000 Hz). For an additional \$10.00, custom logo (call name, ID, etc.) may be added. Custom logo is displayed single size continuously and cycles double size vertically. Custom logo may contain up to 11 positions (numbers, letters and spaces). If custom logo option is chosen, speech of custom logo may be added at no extra charge. Speech is handled position by position.
Order #2040 Disk
Order #2040L Disk, Logo
Order #2040LS Disk, Logo, Speech
#2040 Cassette \$14.95
#2040L Cassette, Logo \$24.95
#2040LS Cassette, Logo, Speech \$24.95

THE QUICKIE X-Basic, Printer, RS232 or Parallel Port required Full documentation included
Tired of messing around with short messages and filing a copy just in case? The quickie may be your answer. This program is actually a mini-text processor, allowing insert and delete, edit, creation of phrases, copy creation, saving to file and more. Put your printer to work.
Order #2080 Disk #2080 Cassette \$14.95

INFORMATION BULLETIN
This is one in a series of information bulletins designed to help you get the most out of your computer and accessories. Now you can swap programs and files over standard radio and telephone circuits without the use of RS232 modems, expansion, etc. If that isn't enough, it works faster than the 300 baud program exchange, requires no modifications to your computer, and can be done with inexpensive off the shelf items. Now how can you resist?
Order #IB-1 \$9.95

VID-COM makes the parallel to parallel connection. Now at last utilize the high speed parallel port on the RS232 expansion card. It will dump to the printer almost three times faster than the 9600 baud serial port. Why tie up your serial port and pay extra for a serial equipped printer?
Introducing the new GX-100 Graphic Printer, featuring: adjustable tractor feed, 80 columns, software control, double width characters, position addressing, and much more!

MODEL	INTERFACE	PRICE	ORDER #
GX-100	NEW 10" Parallel	\$ 209.95	#GX-100P
PROWRITER 8510 AP	10" Parallel	\$ 389.95	#8510P
PROWRITER 2 1550	15" Parallel	\$ 669.95	#550P
PROWRITER 8510 BCD	NEW 10" Serial	\$ 559.95	#8510S Many New Features
PROWRITER 2 1550	15" Serial & Parallel	\$ 719.95	#1550SP
STARWRITER F10-40	Serial or Parallel (specify)	\$1249.00	#F10-40(S) or (P)
PRINTMASTER F10-55	Serial or Parallel (specify)	\$1519.00	#F10-55(S) or (P)
CABLE	Serial or Parallel (specify)	\$ 29.95, \$34.95 Shielded	#PC-(S) or (P)

VID-COM NOW CARRIES ANSI APPROVED 5 1/4" ELEPHANT DISKETTES. ALL OUR PROGRAMS ON DISK UTILIZE THIS FINE PRODUCT.
#D-1 SINGLE SIDE, SINGLE DENSITY, SOFT SECTOR BOX OF 10 DISKS \$19.95 A BOX - CASE OF 10 BOXES \$18.95 A BOX - BULK PACK OF 120 DISKS \$219.00
#D-2 DOUBLE SIDED, DOUBLE DENSITY, SOFT SECTOR BOX OF 10 DISKS \$28.95 A BOX - CASE OF 10 BOXES \$27.95 A BOX - BULK PACK OF 120 DISKS \$329.00

5 1/4" PROFESSIONAL HEAD CLEANING KIT Contents include liquid cleaner and 2 cleaning disks Order #FD-05 \$27.95
5 1/4" FLOPPY LIBRARY BOX Order #LB-105 \$3.95

PROGRAMMERS AND USERS: Do you have a good program or idea? Don't waste it! Send it to VID-COM. VID-COM hereby agrees to non-disclosure of your idea or program. Let's make \$\$\$ together!
DISTRIBUTORS: Are you interested in any specific VID-COM programs, subprograms, or ideas? Write for our sublicense agreement. Exclusive and non-exclusive agreements available. Send \$10.00 (refundable) for information.

ALL PROGRAMS, DATA AND INFORMATION © 1983 VID-COM SEND FOR CATALOG \$2.00 (REFUNDABLE WITH PURCHASE)
TERMS: Add 3% shipping and handling (\$3.00) minimum. Free shipping and handling on software orders over \$50.00. PA residents add 6% sales tax. For the quickest service send money order or cashier's check.
Personal checks may take 14 days to process. DO NOT SEND CASH. Prices, availability and quantity subject to change without notice.
VID-COM will attempt to notify purchaser if changes occur pertaining to their order after placement of this ad. No C.O.D. credit cards or calls accepted. Help us keep your prices low.

obvious and no damage will be done. If it was cabled correctly, the light will not come on, but the drive will 'whirr' slightly when you power up the computer.

To review what we have learned: In order to use a floppy disk system with your computer, you will need a disk drive for 5 1/4", soft-sectored, mini-floppy diskettes. It must handle either 35 or 40 tracks and have a track-to-track access time of about 18 milliseconds or less. As long as your drive has these features, it will probably work with a TI computer. If ordering a non-TI drive, make sure you can return it if it doesn't match up with the computer. If you have any doubts, don't take chances. Stick to a drive that is advertised as TI-compatible.

To hook up a disk drive to your 99/4A, you will need a TI disk drive controller, a TI compatible disk drive, a 34-pin connecting cable, and at least one soft-sectored, single-sided, single-density, mini-floppy diskette.

Armed with all the necessary accouterments, you are now prepared to reap the many benefits the disk system has to offer. Toss those cassettes aside—you are ready to go disko-tech!

This is the first of two parts explaining the operation of disk systems for loading and storing data. Part one examined the necessary hardware. Part two will cover the Disk Operating System, file processing, and disk system advantages.



TRIATHLON TECHNOLOGY by CASIO

Finally... a sportswatch with features developed specifically for one of the most physically demanding sporting events ever.

Engineered for adventure. This incredible timepiece insures precision accuracy throughout the triathlon challenge. Watertight to withstand the long-distance swim—Pace control to improve your bicycling and running performance.

The TRIATHLON WATCH is spot-on accurate to within 1/100th of a second while timing events up to 24 hours. Timer, daily and hourly alarm, and calendar functions come standard. The TRIATHLON WATCH. High-technology AND bullet-proof performance. Get yours today from The BACH Company. **\$29.95**

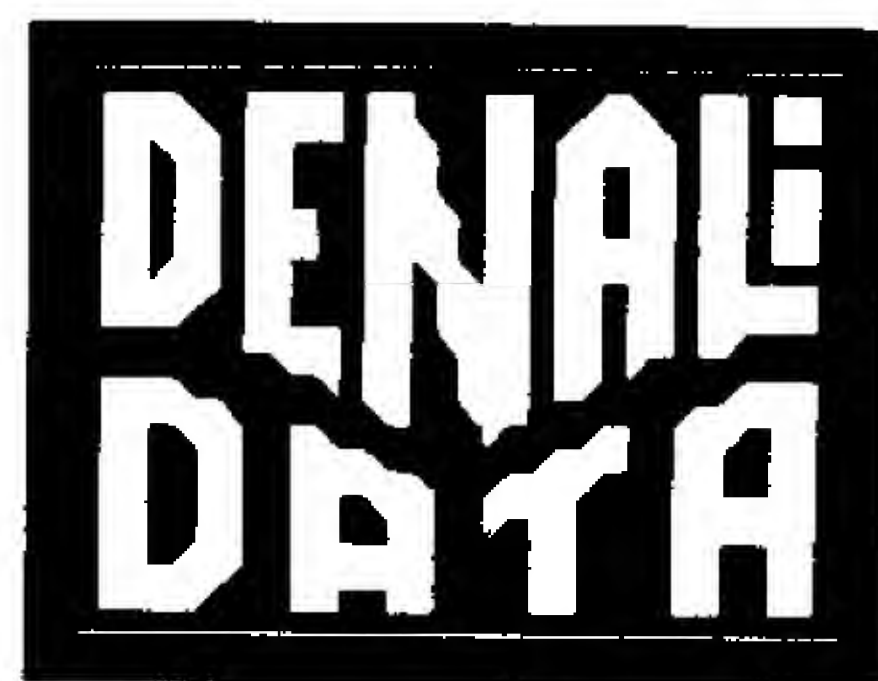
ORDER TOLL FREE

800-227-8292

The BACH Company

715 Ensign Way, Palo Alto, CA 94303

415-494-1995



★ HARDWARE

FOR TI 99/4 or 99/4A HOME COMPUTER

★ CABLES

X-box RS232 Card - (Parallel & Y) 36 pin

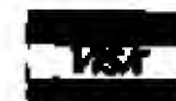
(Serial Port to Printer, Modem, etc.) 9 or 25 pin

SEND FOR CATALOGUE

DENALI DATA DESIGN
1413 N. McKINLEY AVE.
OKC, OK 73106

ORDERS CALL

1-(405) 524-7764



NORTHERN LIGHT SOFTWARE



KING TUT'S TOMB

3D color maze, 4 levels, hidden pitfalls, 7 full chambers, bonus coffins and TUT'S ghost. *(K/J)

JELLYBEANS

Can you put your patch in the conveyor belt's holes and keep the jellybeans from falling? 100 variations. *(K)

TRI-LIGHT

Combo computer/board game, 2 - 4 players (including computer), 3 levels, includes gameboard and 49 pieces. *(K)

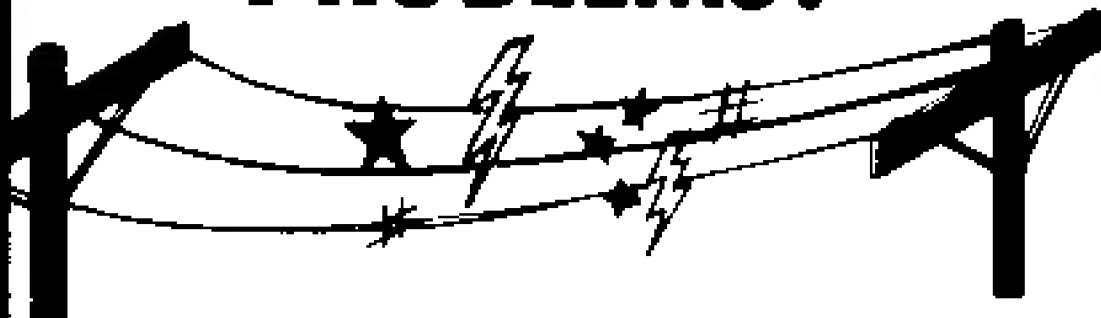
AND MANY OTHERS

cassettes \$14.95 each
diskettes \$19.95 each

*Console basic **Extended basic
(K) Keyboard (J) Joystick
money orders or
certified cheques preferred

NORTHERN LIGHT SOFTWARE
P.O. BOX 11982
EDMONTON, ALBERTA
CANADA T5J 3L1

POWER LINE PROBLEMS?



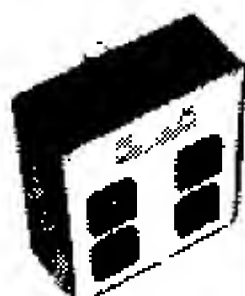
SPIKE-SPIKER® ...THE SOLUTION

Protects, organizes, controls computers & sensitive electronic equipment. Helps prevent software "glitches", unexplained memory loss, and equipment damage. Filter models attenuate conducted RF interference. 120V, 15 Amps. Other models available. Ask for free literature.



DELUXE POWER CONSOLE \$79.95

Transient absorber, dual 5-stage filter, 8 individually switched sockets, fused, main switch, & lite.



QUAD-II \$59.95

Transient absorber, Dual 3 stage filter, 4 sockets, lite.



QUAD-I \$49.95

Transient absorber, 4 sockets.



MINI-II \$44.95

Transient absorber, 3 stage filter, 2 sockets.



6584 Ruch Rd., Dept 99
Bethlehem, PA 18017



215-837-0700

Out of State Order Toll Free

800-523-9685

DEALER INQUIRIES INVITED • CODs add \$3.00 + Ship.

General Filing . . . from p. 16

EXPLANATION OF THE PROGRAM Index

Line Nos.			
150-170	Reserves memory for string and numeric arrays.	1640-1780	program returns to title screen.
180-280	Prints title screen.		Retrieval option, up to three categories; if "4" is entered, all categories are retrieved.
290-340	Receives selection and directs program to proper line.	1790-1890	Input printer options.
		1900-1980	In Retrieval option, cases may be printed either at the selection of the operator (P1 = 2), or automatically, without further input (P1 = 1).
350-510	Opens a file (option #3) and reserves space on disk for 30 categories.		Explain Edit option (#4).
520-730	Checks status of the disk.	1990-2020	Input cases from the disk file.
740	Directs program to appropriate line, depending upon option requested.	2030-2150	
750-770	Category option (#5) sends program into category subroutine. Also allows editing of categories.	2160-2280	Either print the case immediately (P1 = 1), or ask if case should be printed (P1 = 2).
780-870	Explains use of Entering Cases option (#1), and displays number of cases and categories on file.	2290-2390	In Edit option (#4), each case is displayed.
		2400-2490	End program for inputting cases from disk file.
880-940	Opens file #1 (categories) and #2 (cases).		Returns to title screen.
950-1040	Inputs the three 4-letter categories.	2500-2660	Deletes cases.
1050-1080	Accepts 2-letter abbreviation for state.	2670-2820	Subroutine which displays all categories in a file, ten at a time.
1090-1160	Accepts citation of up to 10 characters.	2830-2860	Subroutine holds a screen on display until "ENTER" is pressed.
1170-1200	Inputs summary.	2870-2920	Subroutine indicates full file and returns program to main title screen.
1210-1270	Forms the total "CASES" from all parts entered, including hyphens.	2930-3100	Display categories one-by-one.
1280-1480	All categories for case entered (except "NONE") are compared to existing categories.	3110-3290	Deletes categories chosen to be deleted.
		3300-3480	Subroutine to search the disk for a file name.
1490-1630	Files case in file #2. If no additional cases are to be entered, the files close and	3490	End.

```

100 REM *****
110 REM * FINDEX *
120 REM *****
130 REM BY BRENT R. CROMLEY
140 REM 99'ER VERSION 2.5.1
150 DIM D(101),CAT$(3),CAT$(30)
160 CALL SCREEN(3)
170 CALL CLEAR
180 CALL CLEAR
190 PRINT TAB(9);"FINDEX":;" CH
GOSE MODE:":;"1 ENTER NEW RECD
RDS":;"2 RETRIEVE DATA":;"3 OP
EN A NEW FILE"
200 PRINT :;"4 EDIT AN ENTIRE FILE"
:;"5 REVIEW/EDIT CATEGORIES":;"
IN AN EXISTING FILE":;"6 END
PROGRAM":;
210 CALL SOUND(120,1402,3)
220 CALL KEY(0,K,S)
230 IF (K<49)+(K>54)=-1 THEN 220
240 CALL CLEAR
250 DEL=0
260 MODE=K-48
270 ON MODE GOTO 450,450,290,450,4
50,3420
280 REM OPEN NEW FILE OPTION (#3)
290 PRINT "INSERT A DISK ON WHICH
YOU":;"WANT TO FILE RECORDS.
(YOU":;"MAY USE THIS ONE TO
STORE"
300 PRINT :;"ABOUT 315 RECORDS.. A
CLEAR":;"DISK HOLDS ABOUT 350
.):;
310 GOSUB 2760
320 OPEN #1:"DSK1.CATEGORIES",FIXE
D 28,RELATIVE
330 PRINT #1:0
340 FOR I=1 TO 30
350 PRINT #1:"THIS IS EMPTY FILE"
360 NEXT I

```

```

370 CLOSE #1
380 OPEN #2:"DSK1.CASES",FIXED 142
,RELATIVE
390 PRINT #2:0
400 CLOSE #2
410 PRINT "THE DISK NOW HAS AN":;
"EXISTING FILE.":;
420 USE=1
430 GOSUB 2760
440 GOTO 190
450 IF USE<1 THEN 480
460 PRINT " SAME DISK? (Y/N)":;
:;
470 GOTO 500
480 PRINT "HAVE YOU INSERTED A DIS
K":;"ON WHICH THERE IS AN":;
"EXISTING FILE? (Y/N)":;
:;
490 USE=0
500 CALL SOUND(120,1402,3)
510 CALL KEY(0,K,S)
520 IF K<>78 THEN 540
530 IF USE THEN 480 ELSE 170
540 IF K<>89 THEN 510
550 CALL CLEAR
560 IF USE THEN 670
570 OPEN #1:"DSK1.CATEGORIES",FIXE
D 28,RELATIVE
580 INPUT #1:CATNO
590 FOR I=1 TO CATNO
600 INPUT #1:CAT$(I)
610 NEXT I
620 CLOSE #1
630 USE=1
640 OPEN #2:"DSK1.CASES",FIXED 142
,RELATIVE
650 INPUT #2:CASENO
660 CLOSE #2
670 ON MODE GOTO 710,1570,100,1920
,480
680 REM CATEGORY OPTION (#5)

```


An attractive & practical answer
for **COMMAND MODULE**
storage & access.

Safely holds
ten command
modules for
instant & easy
retrieval



\$12.95*

plus \$2
shipping and
handling

Mail orders to:

Divergent Marketing
1106 2nd St., Suite 126
Encinitas, CA 92024

*CA residents add 6% sales tax

DEJ SOFTWARE ANNOUNCES ITS LATEST PROGRAMS -- ASW TACTICS

DESIGNED BY A NAVY HELICOPTER PILOT,
THIS GAME NEARLY DUPLICATES THE
ACTUAL ANTI-SUBMARINE WARFARE
TACTICS TRAINER USED IN THE FLEET.
A TRUE CHALLENGE AT \$14.95

ASTRO MOUSE

SCORE 9 LASER HITS ON THE LASER CAT
BEFORE HE HITS YOU. BUT DON'T WASTE
TIME--THERE'S A TIME LIMIT. A REAL
SWEAT PRODUCER AT \$12.95

ATTENTION PROGRAMMERS:
SEND US A COPY OF YOUR GAME TAPE
AND WE WILL DISTRIBUTE IT FOR YOU.

DEJ SOFTWARE
575 WISTERIA STREET
CHULA VISTA, CA. 92011

INCLUDE 50¢ POSTAGE WITH ALL ORDERS.
CALIFORNIA RESIDENTS ADD 6%

SAVE

1782 Marietta Blvd. N.W.
Atlanta, Georgia 30318



**Talk
to
Talk**
CORDLESS PHONE



\$99.00

User has effective communication range
between base and portable handset of up
to 200 feet. Consists of 110VAC base unit
& recharge remote unit automatically
from base when not in use. Handset fea-
tures built-in memory to recall last number
called on one button command.

Talk & Talk is just one of many fine prod-
ucts carried by SAVE. To see our complete
line, send \$5.00 for our 80 page catalogue
of exceptional values, refundable with
your first purchase.

Use your American Express, VISA,
Mastercard, check or money order. Mini-
mum order of \$50. Shipping and handling
charges are extra. All prices are subject to
change without notice. Allow 2-4 weeks for
delivery. Prices good through May 15, 1983.

Order Toll Free 1-800-241-2682
In Georgia (404) 351-8459

Index

```

690 GOSUB 2600
700 GOTO 190
710 REM ENTERING OPTION (#1)
720 PRINT "YOU HAVE";CATNO;" CATE-
GORIES ON":"FILE. EACH RECO-
RD IS FILED":"UNDER 1, 2 OR 3
CATEGORIES.":
730 IF CATNO<30 THEN 770
740 PRINT "YOU HAVE USED ALL 30
CATE-":"GORIES ON THIS DISK,
SO YOU":"MAY NOT FILE RECORDS
UNDER A"
750 PRINT "NEW CATEGORY.":
760 GOTO 790
770 PRINT "IF YOU USE A NEW CATEG-
ORY":"I WILL ASK YOU TO EXPL-
AIN":"IT. I WILL RECORD THE N-
EW"
780 PRINT "CATEGORY AND EXPLANA-
TION.":"DO NOT USE COMMAS!":
790 PRINT "YOU HAVE";CASENO;"RECO-
DS ON FILE.":
800 GOSUB 2740
810 OPEN #2:"DSK1.CASES",FIXED 142
,RELATIVE
820 OPEN #1:"DSK1.CATEGORIES",FIXE-
D 28,RELATIVE
830 CALL CLEAR
840 INPUT #2,REC CASENO:A$
850 IF EOF(2)>-1 THEN 880
860 GOSUB 2800
870 GOTO 1540
880 FOR I=1 TO 3
890 CALL CLEAR
900 PRINT "ENTER CATEGORY #";I;"OR
""CAT""":"TO SEE CATEGORIES.
":
910 IF I<2 THEN 930
920 PRINT "IF USING LESS THAN THR-
EE":"CATEGORIES, YOU MAY ENTE-
R":"""NONE""":
930 INPUT CATT$(I)
940 IF CATT$(I)<>"CAT" THEN 960
950 GOSUB 2600
960 IF LEN(CATT$(I))<>4 THEN 890
970 NEXT I
980 CALL CLEAR
990 PRINT "ENTER 2-LETTER ABBREVIA-
TION":"OF STATE, OR YOUR OWN
REF.":"CODE.":
1000 INPUT ST$
1010 IF LEN(ST$)<>2 THEN 980
1020 CALL CLEAR
1030 PRINT "USE NO MORE THAN 10 LET-
TERS,":"NUMBERS AND SPACES F-
OR CITE:":
1040 INPUT CITE$
1050 IF LEN(CITE$)>10 THEN 1020
1060 CALL CLEAR

```

```

1070 FOR I=1 TO 10-LEN(CITE$)
1080 CITE$=CITE$&"-"
1090 NEXT I
1100 PRINT "ENTER SUMMARY OF RECORD
":"USING 4 LINES OR LESS. YOU
":"MAY WANT TO USE A KEY WORD
":
1110 PRINT "TO IDENTIFY THE NAME O-
F":"RECORD, AND YOU MAY WANT
TO":"INCLUDE THE DATE.":
1120 PRINT "DO NOT USE COMMAS!":
1130 INPUT SUM$
1140 CALL CLEAR
1150 CASE$=CATT$(1)&"-"&CATT$(2)&"-
"&CATT$(3)&"-"&ST$&"-"&CITE$&S-
UM$
1160 PRINT "CHECK IT CAREFULLY
":"CASE$":"OKAY? (Y/N
)":
1170 CALL SOUND(120,1402,3)
1180 CALL KEY(0,K,S)
1190 IF K=78 THEN 880
1200 IF K<>89 THEN 1180
1210 CALL CLEAR
1220 REM TEST FOR NEW CATEGORY
1230 FOR I=1 TO 3
1240 IF CATT$(I)="NONE" THEN 1410
1250 FOR J=1 TO CATNO
1260 IF CATT$(I)=SEG$(CAT$(J),1,4) T-
HEN 1410
1270 NEXT J
1280 IF CATNO<30 THEN 1320
1290 CALL CLEAR
1300 PRINT "YOU MAY NOT FILE THIS R-
ECORD":"BECAUSE ":"CATT$(I);":"
WOULD PUT THE":"TOTAL CATEGOR-
IES OVER 30.":
1310 GOTO 1480
1320 CALL CLEAR
1330 PRINT "ENTER EXPLANATION OF ":"
CATT$(I)":"WITH 23 OR LESS LE-
TTERS.":
1340 INPUT X$
1350 IF LEN(X$)>23 THEN 1320
1360 CATT$(I)=CATT$(I)&"-"&X$
1370 CATNO=CATNO+1
1380 PRINT #1,REC CATNO:CATT$(I)
1390 PRINT #1,REC 0:CATNO
1400 CAT$(CATNO)=CATT$(I)
1410 NEXT I
1420 CALL CLEAR
1430 PRINT "THE RECORD WILL NOW BE
FILED":
1440 PRINT #2,REC CASENO+1:CASE$
1450 CASENO=CASENO+1
1460 PRINT #2,REC 0:CASENO
1470 CALL CLEAR
1480 PRINT "DO YOU WANT TO ENTER AD-
DI-":"TIONAL RECORDS NOW?
(Y/N)":

```

Continued on p. 62

TImagination

Box 2805 Fairfield, CA 94533

**PROUDLY PRESENTS TWO
UNIQUE NEW
FANTASY GAMES . . .**

• ZOMBIE MAMBO •

JOURNEY INTO THE SUPERNATURAL WORLD
OF THE UNDEAD AS YOU SEARCH FOR THE
KEYS TO THE SORCERER'S CRYPT, BURIED
SOMEWHERE IN THE CEMETERY'S MANY
GRAVES. THE CRYPT'S SUBTERRANEAN MAZE
OF TUNNELS AND CHAMBERS AWAITS YOU IN
YOUR QUEST FOR THE SORCERER'S SECRET
TREASURES, GUARDED BY MYSTICAL CREA-
TURES OF UNTOLD POWERS. A SUPERB ANI-
MATED GRAPHICS ADVENTURE!
TWO-PROGRAM TAPE, ONLY \$22.95 ppd.

• WALLS AND BRIDGES •

TRAVEL BACK IN TIME TO THE DARK AGES, TO
A LAND RULED BY WARLORDS, MENACED BY
DRAGONS, DEMONS, AND BOOGIEMEN,
WHERE BRAVE KNIGHTS FIGHT GALLANTLY
FOR THEIR MASTERS. BRILLIANT COLOR
GRAPHICS AND SOUND EFFECTS MAKE THIS
TOURNAMENT OF SKILL AND DARING COME
ALIVE FOR 1 OR 2 PLAYERS. ONLY \$19.95 ppd.

PROGRAMS SUPPLIED ON CERTIFIED CASSETTE
TAPE. BOTH REQUIRE ONLY JOYSTICK TO RUN
AND COME COMPLETE WITH USER MANUAL.

SPECIAL . . . BOTH GAMES ONLY \$29.95 ppd!
(CA residents add 6% sales tax)

MICRONOVA presents the HOME COMPUTER DIRECTORY

Put the world of your TI 99/4(A) at your fingertips with this unique information resource handbook!! The Directory contains hundreds of useful contacts and source material on . . .

- ★ Over 100 Software Businesses
- ★ TI Hotlines and contacts
- ★ Sources of technical information
- ★ Business and Market news
- ★ Future trends and new offerings
- ★ Computer Advantage Clubs
- ★ Publications ★ Logo & CAI contacts
- ★ Multilevel Marketing scene
- ★ Users Groups ★ Learning to program
- ★ On-line databases ★ And much more!

Send \$4.95 check or money order to:

MICRONOVA 99
P.O. Box 1058
Northampton, MA 01061

TEXTIGER[®] WORD PROCESSOR SOFTWARE

The only **complete** processor that **does not** require ram expansion. (Not a typewriter emulator needing extra-cost options). **Automatically** collects, combines, formats, justifies, paginates, and prints any mix of files. (Address, text, form, etc.)

Fast, **powerful** editing, processing, & cataloging. Requires: Extended Basic Module, Printer (EPSON, IDS, TI, SC, etc.) & disk drive or cassette. Versions: I=99/4, II=99/4A
\$59.95 + CA TAX.

SATISFACTION OR MONEY BACK. Request free info or borrow our VHS VIDEOTAPE!
TEXTIGER, 24433 Hawthorne Blvd.
Torrance, CA 90505. (213) 378-9286

VISA/MC

PULSAR

A high level, deep space game that requires skill and training to name valuable ore and survive all 6 on Pulsar. Utilizes speech synthesizer. XBASIC \$13.

ION GAMING

Comprehensive manual and Graphics Editor for designing your own games. A must for the beginner and advanced programmer. XBASIC \$23.

MMM EDIT-ASSEMBLER

Powerful editor with enhanced assembler allows programming at 4K or the MMM (ACORG 57118) without having your source code. MMM \$25.

DECODER

Turns random code back into assembly language. MMM \$13 (or \$19 with the purchase of Edit/Assembler).



eggbert

is coming soon...

C.A. Root Assoc. Suite B109 33125
15th Avenue Federal Way, WA 98003

JUST PLAYING GAMES?

You could be designing them with

THE MAXIMUM ASSEMBLER FOR THE MINI-MEMORY MODULE

Without spending hundreds of dollars for disk and peripherals, you can have this effective tool for creating **LARGE** programs in high-speed assembly language. Requires just the Mini-Memory Module, a cassette recorder, and your TI99/4A console.

THE MAXimum Assembler* outperforms the Line-By-Line Assembler that comes with the MMM.

Compare these features:

	Line-By-Line	THE MAX
User Program		
Object Size	760 bytes	3808 bytes
Label Size	1 or 2 chars	1 to 6 chars
Number of Labels	10	100 plus
Saving Source Input	No	Yes
Source Editing	limited	complete
Full Instruction Set	yes	yes
Access to Utility		
Subroutines	by EQU only	directly by name
Odd Byte-alignment	not allowed	fully supported
Directives	minimal	greatly enhanced

Get THE MAX, the smart assembler... and start creating your own powerful software for the TI99/4A.

PRICE: \$25.00

Instructions included with cassette

Send check or, for faster service, Money order to:

M. K. ECKHAUS

P.O. Box 1079 — Elgin, Illinois 60120

Inquiry honored only with SASE.

*T.I. Editor/Assembler manual recommended—may be ordered from T.I.

Index . . . from p. 61

```

1470 CALL SOUND(120,1402,3)
1500 CALL KEY(0,K,S)
1510 IF K=89 THEN 830
1520 IF K<>78 THEN 1500
1530 CALL CLEAR
1540 CLOSE #2
1550 CLOSE #1
1560 GOTO 170
1570 REM RETRIEVAL OPTION (#2)
1580 PRINT "YOU MAY REVIEW RECORDS
UNDER":1, 2, 3 OR ALL CATEGO
RIES.":::"PUSH 1, 2, 3 OR 4
- (4=ALL)":
1590 CALL SOUND(120,1402,3)
1600 CALL KEY(0,K,S)
1610 IF (K<49)+(K>52)=-1 THEN 1600
1620 CATTNO=K-48
1630 IF CATTNO=4 THEN 1720
1640 FOR I=1 TO CATTNO
1650 CALL CLEAR
1660 PRINT "ENTER 4 LETTERS OF DATE
GORY":1,2,3,4 OR "CAT" TO REVIE
W":1,2,3,4 CATEGORIES:"
1670 INPUT CATT$(I)
1680 IF CATT$(I)<>"CAT" THEN 1700
1690 GOSUB 2600
1700 IF LEN(CATT$(I))<>4 THEN 1650
1710 NEXT I
1720 CALL CLEAR
1730 CALL SOUND(120,1402,3)
1740 PRINT "ARE YOU USING PRINTER (
Y/N)":
1750 CALL KEY(0,K,S)
1760 IF K=89 THEN 1800
1770 IF K<>78 THEN 1750
1780 CALL CLEAR
1790 GOTO 1960
1800 PRINT "ENTER FULL SPECIFICATIO
NS":1,2,3,4 FOR PRINTER:"
1810 INPUT P$
1820 OPEN #3:P$
1830 CALL CLEAR
1840 PRINT "CHOOSE PROPER FORM
AT":1,2,3,4 PRINT ALL RECORDS W
ITHOUT:" DISPLAYING ON SCRE
EN":
1850 PRINT "2 SELECTIVE PRINTING F
ROM":1,2,3,4 RECORDS DISPLAYED ON SC
REEN":
1860 CALL SOUND(120,1402,3)
1870 CALL KEY(0,K,S)
1880 IF (K<49)+(K>50)=-1 THEN 1870
1890 CALL CLEAR
1900 P1=K-48
1910 GOTO 1960
1920 REM EDIT OPTION (#4)
1930 PRINT "RECORDS WILL BE DISPLAY
ED":1,2,3,4 ONE BY ONE. IF YOU WANT
TO":1,2,3,4 SAVE THAT RECORD, PUSH "
"N":1,2,3,4.

```

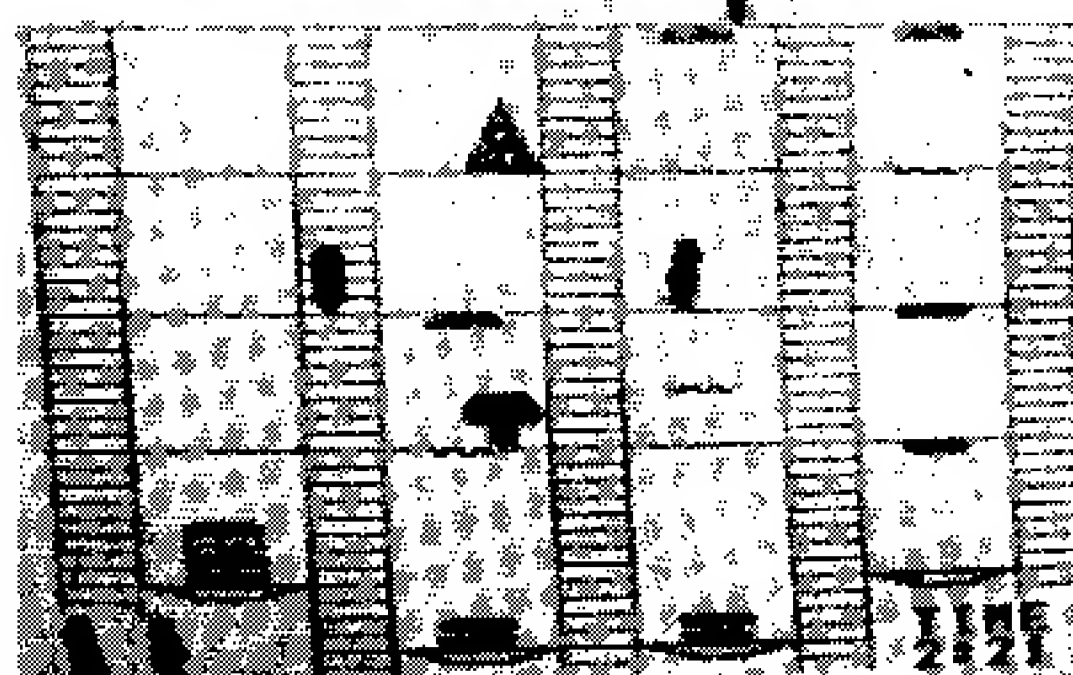
```

1940 PRINT "TO DELETE, PUSH "Y":1,2,3,4.
:::
1950 GOSUB 2760
1960 REM INPUT
1970 OPEN #2:"DSK1.CASES",FIXED 142
,RELATIVE
1980 INPUT #2:CASENO
1990 FOR I=1 TO CASENO
2000 INPUT #2,REC I:CASE$
2010 IF MODE=4 THEN 2100
2020 IF CATTNO=4 THEN 2090
2030 FOR J=1 TO CATTNO
2040 IF SEG$(CASE$,1,4)=CATT$(J)THE
N 2090
2050 IF SEG$(CASE$,6,4)=CATT$(J)THE
N 2090
2060 IF SEG$(CASE$,11,4)=CATT$(J)TH
EN 2090
2070 NEXT J
2080 GOTO 2330
2090 IF P1=1 THEN 2200
2100 CALL CLEAR
2110 PRINT CASE$:1,2,3,4
2120 IF MODE=4 THEN 2220
2130 IF P1<>2 THEN 2150
2140 PRINT "PUSH "P" TO PRINT REC
, OR":
2150 PRINT "PUSH "ENTER" TO CONTI
NUE."
2160 CALL SOUND(120,1402,3)
2170 CALL KEY(0,K,S)
2180 IF K=13 THEN 2290
2190 IF K<>80 THEN 2170
2200 PRINT #3:SEG$(CASE$,1,28):SEG$
(CASE$,29,LEN(CASE$)-28):::
2210 GOTO 2290
2220 PRINT "DELETE? (Y/N)":
2230 CALL SOUND(120,1402,3)
2240 CALL KEY(0,K,S)
2250 IF K=78 THEN 2290
2260 IF K<>89 THEN 2240
2270 DEL=DEL+1
2280 D(DEL)=I
2290 CALL CLEAR
2300 IF DEL<100 THEN 2330
2310 PRINT "YOU NOW HAVE DELETED 10
0":1,2,3,4 RECORDS. THIS IS THE MAX
IMUM":1,2,3,4 FOR ONE OPERATION.
:::
2320 GOTO 2430
2330 NEXT I
2340 CALL CLEAR
2350 PRINT "THAT IS ALL RECORDS.":
:::
2360 IF MODE=4 THEN 2430
2370 IF P1=0 THEN 2400
2380 CLOSE #3
2390 P1=0
2400 CLOSE #2
2410 GOSUB 2760

```

BURGER BUILDER

TOP BURGER BUILDER SCORE
22100



The Burger Builder Chef is under your control and you have only 5 minutes to build 4 hamburgers on the plates below. Squash the enemy under the buns for extra points.

Written in 100% 9900 Assembly Language.

\$24.95 Full money back guarantee!

Equipment required: Memory Expansion, Disk Drive, Extended Basic (Joysticks optional).

Software Specialties, Inc.

Box 18051, Denver, Co 80218

DISK DRIVES

NEW, SINGLE SIDED
SINGLE OR DUAL DENSITY
INSERT DIRECTLY INTO
PERIPHERAL EXPANSION BOX

\$185.00

\$175.00 ea/10

Check/money order/C.O.D.

Include \$4.00/drive P & H

Computer Peripherals Unlimited

P. O. Box 753

Brigham City, Utah 84302

(801) 734-2570

CUMBERLAND TECHNOLOGY

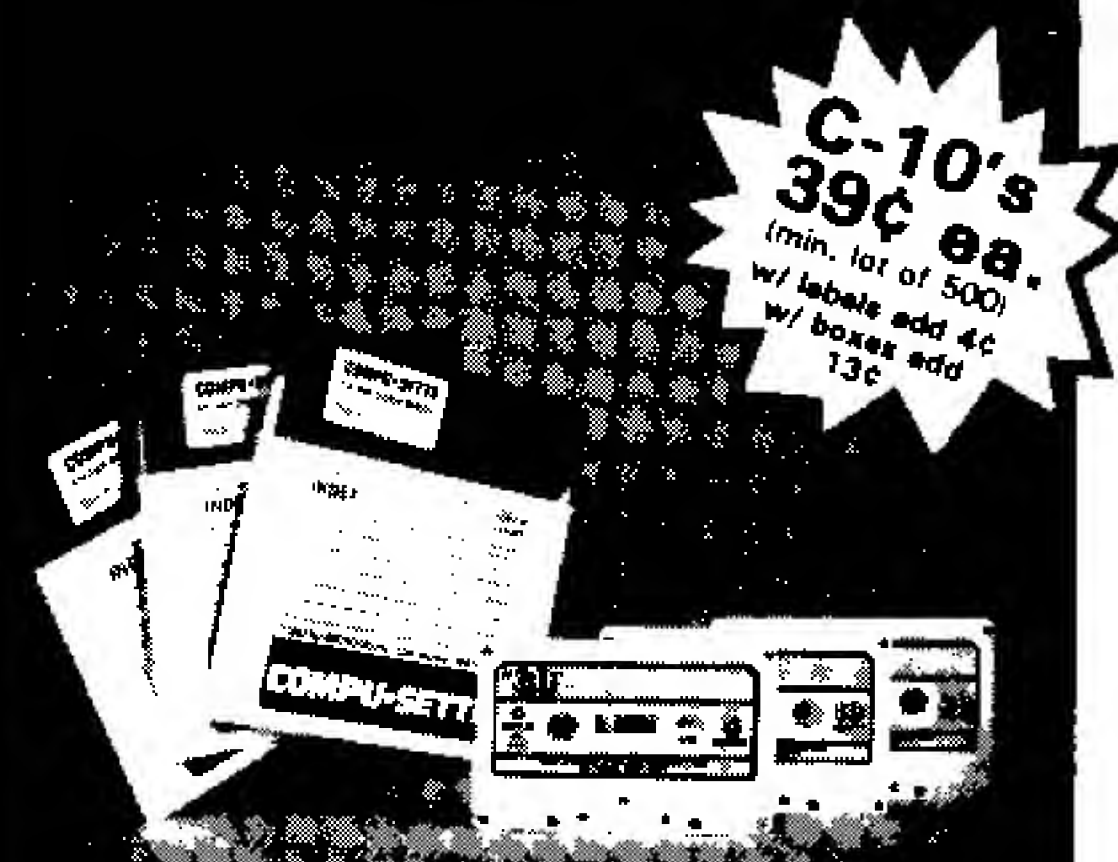
10 Wagner Drive
Carlisle, PA 17013

99/4(A) Programs

- ENGINEERING
- MATH
- PROGRAMMING AIDS
- GAMES
- Many programs written in Assembly Language

Please send name and address
for a current list

COMPU • SETTE® TAPES & DISKS



- 100% Error-Free
- Fully Guaranteed
- Used by Hobbyists, software firms and school districts nationwide

Cassettes	12-pak	24-pak
C-05	.79	.69
C-10	.89	.79
C-20	.99	.89
C-30	1.29	1.19
Custom Case	.26	.21

5 1/4 inch Diskettes	Mini 5-Pak	Std. 10-Pak
SS/DD	14.95	26.95
Custom Case, Add . .	3.00	
-- Specify your computer system --		

UPS SHIPPING

\$3.00 per pak
Canadians Multiply by 2

TOLL-FREE

(for orders only)

1-800-528-6050

Ext. 3005

— In Arizona —

1-800-352-0458

Ext. 3005

MICRO-80 INC.

2665-T Busby Road
Oak Harbor, WA 98277
1-(206)-675-6143

Index

```

2420 GOTO 190
2430 IF DEL<1 THEN 2560
2440 X=1
2450 PRINT "STAND BY WHILE";DEL;" R
    ECORDS":;"ARE DELETED..."
2460 FOR I=D(1) TO CASEND-DEL
2470 IF I+X<>D(X+1) THEN 2500
2480 X=X+1
2490 GOTO 2470
2500 INPUT #2,REC I+X:CASE$
2510 PRINT #2,REC I:CASE$
2520 NEXT I
2530 CASEND=CASEND-DEL
2540 PRINT #2,REC 0:CASEND
2550 CALL CLEAR
2560 PRINT "YOU NOW HAVE";CASEND;"R
    ECORDS ON":;"FILE ON THIS DIS
    K.":;"":
2570 CLOSE #2
2580 GOSUB 2760
2590 GOTO 190
2600 REM CATEGORY SUBROUTINE
2610 CALL SCREEN(16)
2620 FOR II=1 TO CATNO
2630 IF (II-1)/10>INT((II-1)/10) THE
    N 2660
2640 CALL CLEAR
2650 PRINT "      CATEGORIES, PAGE";
    INT(II/10)+1:;
2660 PRINT CAT$(II):;
2670 IF II=CATNO THEN 2690
2680 IF II/10>INT(II/10) THEN 2710
2690 PRINT
2700 GOSUB 2760
2710 NEXT II
2720 IF MODE$S THEN 2740
2730 GOSUB 2860
2740 CALL SCREEN(3)
2750 RETURN
2760 REM "PRESS ENTER" ROUTINE
2770 INPUT "PRESS ""ENTER"" TO CONT
    INUE. ":X$
2780 CALL CLEAR
2790 RETURN
2800 REM END OF FILE
2810 CALL CLEAR
2820 PRINT "THIS FILE HAS";CASEND;"
    RECORDS":;"AND IS FULL. YOU WI
    LL HAVE":;"TO DELETE SOME REC
    ORDS OR":;
2830 PRINT "START A NEW FILE.":;
2840 GOSUB 2760
2850 RETURN
2860 REM EDIT CATEGORIES
2870 CALL CLEAR
2880 PRINT "DO YOU WANT TO EDIT OUT
    ANY":;"CATEGORIES? (Y/N)":;
    :;
2890 CALL SOUND(120,1402,3)
2900 CALL KEY(0,K,S)

```

```

2910 IF K=78 THEN 3210
2920 IF K<>89 THEN 2900
2930 FOR I=1 TO CATNO
2940 CALL CLEAR
2950 PRINT CAT$(I):;"      DELETE?
    (Y/N)"
2960 CALL SOUND(120,1402,3)
2970 CALL KEY(0,K,S)
2980 IF K=78 THEN 3020
2990 IF K<>89 THEN 2970
3000 DEL=DEL+1
3010 D(DEL)=I
3020 NEXT I
3030 CALL CLEAR
3040 IF DEL<1 THEN 3210
3050 X=1
3060 PRINT "THE";DEL;"CATEGORIES WI
    LL":;"NOW BE REMOVED.":;
3070 OPEN #1:"DSK1.CATEGORIES",FIE
    D 28,RELATIVE
3080 FOR I=D(1) TO CATNO-DEL
3090 IF I+X<>D(X+1) THEN 3120
3100 X=X+1
3110 GOTO 3090
3120 INPUT #1,REC I+X:X$
3130 PRINT #1,REC I:X$
3140 CAT$(I)=X$
3150 NEXT I
3160 CATNO=CATNO-DEL
3170 PRINT #1,REC 0:CATNO
3180 CLOSE #1
3190 PRINT "YOU NOW HAVE";CATNO;"CA
    TEGORIES":;"ON FILE ON THIS DI
    SK.":;
3200 GOSUB 2760
3210 CALL CLEAR
3220 RETURN
3230 OPEN #3:"DSK1.",INTERNAL,RELAT
    IVE,INPUT
3240 INPUT #3:PR$,PR,PR,PR
3250 IF PR$="" THEN 3320
3260 IF PR$="CASES" THEN 3290
3270 IF PR$="CATEGORIES" THEN 3290
3280 GOTO 3240
3290 CLOSE #3
3300 REPET=2
3310 RETURN
3320 PRINT "FILE IS NOT FOUND ON DI
    SK"
3330 INPUT "TRY AGAIN (Y/N)":AGA$
3340 IF (AGA$<>"Y")*(AGA$<>"N") THEN
    3330
3350 IF AGA$="N" THEN 3390
3360 REPET=1
3370 CLOSE #3
3380 RETURN
3390 REPET=0
3400 CLOSE #3
3410 RETURN
3420 END

```


NEWS FLASH

Dealers, distributors, & chain store buyers will be able to see the revolutionary new line of 99'er-ware software, accessories, & books at the June Consumer Electronics Show in Emerald Valley Publishing Co.'s Booth #5216 in McCormack West—the next aisle over from TI.

Excerpts from the

99'ER DIGEST™

of news & happenings in
the Home Computer world

PRICE EROSION IN MARKETPLACE NIXES BASIC COMPUTER

Because of the rapid price erosion in the color home computer market—the 99/4A's street price dropping to about \$150 in mid-April, with a further \$50 slide when the new rebate goes into effect June 1st—Texas Instruments will hold off launching full-scale production of the 99/2 Basic Computer. Instead, TI will conduct test market studies to determine whether a sufficient market exists for the 99/2 at its current and projected price points. The decision to lower the 99/4A's price will make the full-featured color computer attractive to the wider audience which the 99/2 would have captured, keeping TI competitive in the under-\$100 market.

PEGASUS TECHNOLOGY MAY MIGRATE TO THE HOME

The question that looms in the minds of industry watchers these days is how long it will take for the state-of-the-art technology announced for the TI Professional Computer (code-named Pegasus) to migrate from TI's Austin-based Data Systems Group to Lubbock's Consumer Products Group and wind up on the Home Computer. The first offering, a speech options package, permits voice-commanded operation, and allows speech and textual data to be combined, stored, forwarded, and replayed—emulating a "smart" telephone in the process. The natural language interface allows users to speak in common English words and phrases when asking database questions or giving commands for specific tasks.

NEW USER-FRIENDLY PRINTING TERMINAL MAKES DEBUT

This month, TI starts shipping its 6th generation of silent 700 portable data terminals—a new line of lightweight battery-powered teleprinters that fit inside half the space of a standard briefcase. Higher levels of chip integration are responsible for both its small size and relatively low price—\$695 suggested retail for a model with built-in 300-baud modem. Optional 2K plug-in CMOS software cartridges allow users to create a directory of auto-dial telephone numbers and automatic log-ons. Although these units are being targeted mostly at business customers wanting a low-cost, desk-top keyboard terminal, Compact Computer and peripheral users can expect to see much of this technology appearing in the Consumer Group products as well.

DISK-BASED PRODUCTS EXPECTED TO BOOM


Falling prices in the Home Computer marketplace have magnified the need for lower system prices when adding peripherals. The present Peripheral Expansion Box will no longer present a viable option for the vast majority of the additional millions of consumers who will be buying under-\$100 computers. The Digest therefore expects to see new, very-low-cost peripherals for the Home Computer. In the mass-storage department, a good candidate for users who need more performance than a Wafertape can offer would be small disk drives that interface via a Hex-bus. Third-party software developers take note.

99'er Digest is a marketing information service for retailers, distributors, third-party vendors, sales representatives, industry analysts, and other TI-watchers interested in the home computing, personal computing, and portable computing markets in which Texas Instruments is present. The publication is issued biweekly and mailed First Class. Appropriate items of consumer interest are excerpted from the Digest in the monthly 99'er Home Computer Magazine. For subscription details contact: Emerald Valley Publishing Co., 1500 Valley River Drive, Suite 250, Eugene, OR 97401.

99'er Digest is a trademark of Emerald Valley Publishing Co.

SUBSCRIBE TODAY
SAVE OVER 40% on the SINGLE-COPY PRICE!

RENEW TODAY
DON'T MISS A SINGLE ISSUE!


 Subscription		RENEWAL SUBSCRIBERS PLEASE INCLUDE INFORMATION BELOW FROM PREVIOUS MAILING LABEL:	
<input type="checkbox"/> NEW SUBSCRIPTION <input type="checkbox"/> SUBSCRIPTION RENEWAL <small>(Allow 6-8 wks for your first issue)</small>		Subscriber Code Number (line above your name on mailing label)	
Term	U.S.A.	Canada & Mexico	Foreign Surface Foreign Air
1-yr (12 Issues)	\$25	\$32	\$43 Inquire
2-yr (24 Issues)	\$45	\$52	<small>Please enclose payment in U.S. FUNDS or Credit Card bringing information as indicated below.</small>
3-yr (36 Issues)	\$63	\$70	
BACK ISSUES AVAILABLE WHILE SUPPLIES LAST			
Circle Issues Desired	Vol. 1 No. 6	Nov. '82	Dec. '82 Jan. '83 Feb. '83
Postpaid	\$3.95 ea. USA		Mar. '83 Apr. '83
	\$5.50 ea. Foreign Surface		
	\$4.50 ea. Canada & Mexico		
	\$7.50 ea. Foreign Air Mail		
		TOTAL	
Bill my: <input type="checkbox"/> VISA <input type="checkbox"/> Master Card			
<div style="border:1px solid black; width:150px; height:15px; display: flex; flex-direction: row-reverse;"><div style="width:100%; height:100%;"></div></div>		Expiration Date	
Account No.			
Tel. No.		Signature	
		NAME _____ PLEASE	
		ADDRESS _____ PRINT	
		CITY _____ STATE _____ ZIP _____	
Please indicate below any change in name or address.			
		NAME _____ PLEASE	
		ADDRESS _____ PRINT	
		CITY _____ STATE _____ ZIP _____	
		Check <input type="checkbox"/> MUST BE IN U.S. FUNDS Address shown is	
		enclosed DRAWN ON A U.S. BANK <input type="checkbox"/> Business <input type="checkbox"/> Home	

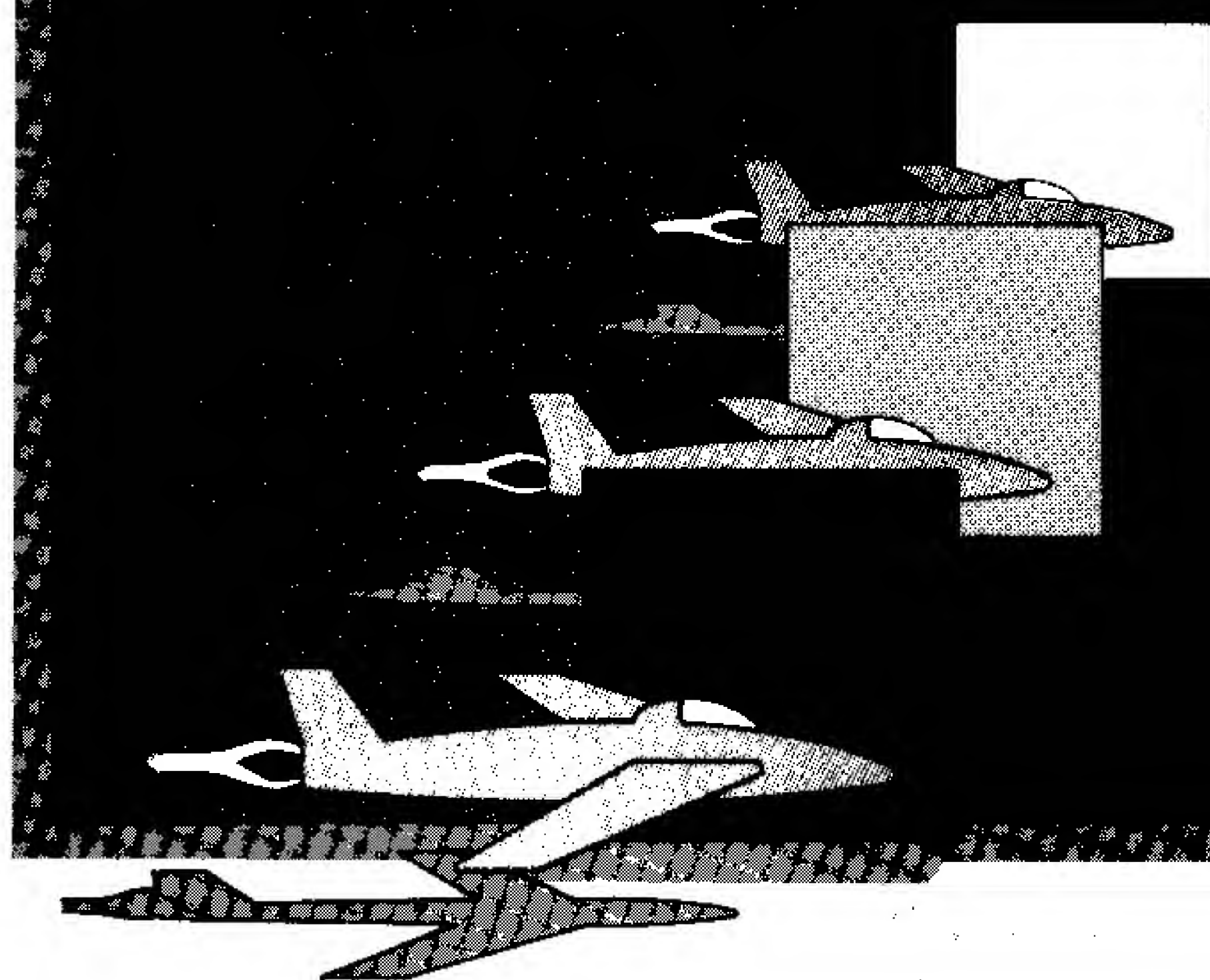
SUBSCRIPTION BONUS: Only Subscribers Will Receive The 99'er BUYERS'S GUIDE Bound Into Each Issue

PLACE
STAMP
HERE



P.O. Box 5537
Eugene, OR 97405

NAME _____ PLEASE		 <small>*U.S. ONLY - FOREIGN SURFACE ADD \$2.00 TO TOTAL SHIPPING COSTS.</small>	
ADDRESS _____ PRINT			
CITY _____ STATE _____ ZIP _____			
<input type="checkbox"/> Check enclosed MUST BE IN U.S. FUNDS Address shown is			
DRAWN ON A U.S. BANK <input type="checkbox"/> Business <input type="checkbox"/> Home			
Bill my: <input type="checkbox"/> VISA <input type="checkbox"/> Master Card			
<div style="border:1px solid black; width:150px; height:15px; display: flex; flex-direction: row-reverse;"><div style="width:100%; height:100%;"></div></div>			
Account No.		Expiration Date	
Tel. No.		Signature	
99'er BOOKSTORE™			
QTY	TITLE	PRICE	TOTAL AMOUNT
Shipping and Handling: In U.S.A. — \$2.00 for 1 book; 75¢ for each additional book. Foreign Surface — add \$2.00 to total U.S.A. shipping costs.			
POSTAGE SUBTOTAL			
99'er™ Circle tapes desired TOTAL			
M1/6, M2/1, M2/2, M2/3, M2/4, M2/5			
SHIPPING — \$1.00 for 1st TAPE, 50¢ ea. add.			
Foreign Orders Shipped Airmail — \$3.00 for 1st TAPE, 75¢ ea. add.			
SUBTOTAL			
99'er-ware™			
QTY	ITEM	PRICE	TOTAL AMOUNT
	99'er FINDER — BINDER	\$10.95	
	SHIPPING — \$3.00 ea.*		
	6— DIGITAL COMPUTER CASSETTES	\$7.00	
	SHIPPING — 2.00 ea.*		
	SPECIAL: 99'er Finder — Binder		
	•with 6 blank cassettes for only	\$16.95	
	•with 12 blank cassettes for only	\$21.95	
	SHIPPING — \$4.00 ea.*		
	TEX — SETTE ADAPTOR	\$5.95	
	SHIPPING — \$1.00 ea.*		
	DUST COVERS: See prices on page 68. Indicate choices below.		
	SHIPPING — \$2.00 for 1st COVER, 50¢ ea. add.*		
SUBTOTAL			
TOTAL AMOUNT OF ORDER			



SPRITES IN DEPTH

W. K. Balthrop

Technical Editor

How is a Cyclops like a video screen? They both have only one eye. We fortunate humans have two, but have you ever wondered why we don't have the second one on the back of our heads so we could back out of the driveway without using our rearview mirrors? Without two eyes in front, we would be no better off than the Cyclops. We need both eyes right where they are so we can perceive the world in dimensions of height, width and depth.

The inability to provide all three dimensions is a major drawback of the video screen. No matter how high the resolution of the graphics, their two-dimensional quality detracts from their realism. To get around this problem, programmers have resigned themselves to using tricks on the screen, or *optical illusions*, to fool the mind into thinking it is looking at a three-dimensional object. This has normally required expensive computers and graphics terminals—until now.

Three-D Video

TI's 9918A video controller chip, used in the 99/4A, now offers three-dimensional

screen effects to the average consumer. Among the graphics are sprites—best known for their ability to move with high resolution across the screen. As we will see, there is more to the sprite than meets the eye.

Sprites have an uncanny ability to make us think we are seeing in three dimensions. By overlapping, or making one sprite appear to be behind another, we simulate the third dimension: depth of field. This first short program illustrates how this effect can be used. The program is not complete to run as a game; it is only a demonstration of the three-dimensional effects of sprites.

Line number 170 clears the screen and sets the background to black. Lines 180 and 190 assign a graphics pattern to 8 characters. Notice that only two CALL CHARs were used. By extending the pattern code to 64 hexadecimal characters, four characters are defined for each statement. Line number 200 sets the sprite number to two, and the magnification mode to four. A magnification of four creates double-sized sprites made up of four characters, so that each sprite is 32×32 pixels. This was done only so that the effect would be easier to see, and is not necessary for the three-dimensional effect.

Line numbers 210 through 240 place eight large sprite squares on the screen. The sprites are numbered 2, 4, 6, 8, 10, 12, 14, and 16, with sprite #2 at the lower left-hand corner. You will notice that each sprite overlaps one quarter of another sprite. The sprite with the lowest number appears to be on top of the higher-numbered sprite. This in itself gives the illusion of depth, and it can be done with simple graphic characters. The next step, however, can not be done without sprites, as you will see.

Line 250 resets the sprite counter to sprite #1. Line numbers 260 through 280 place eight more sprites on the screen. This time they resemble space ships. These sprites now appear to lie between each of the large squares (except for the front one). This is because the space ships have been numbered 1, 3, 5, 7, 9, 11, 13, and 15.

By giving the space ships motion in Lines 290 and 300, they appear to travel between the square walls we have created. The special effects you can create using this method are limited only by your imagination. You now can work with all three dimensions.

The Shadow of Your Sprite

When you walk down the street on a sunny day, you may turn around to be confronted with a double of yourself. There on the sidewalk lies your shadow. Now, with the help of sprites, you can give your graphics a shadow too.

You can use these shadows to give your graphics an additional illusion of three dimensions. In the first program, we used overlapping sprites to simulate depth. Now we are going to use that feature with the addition of a shadow to show an airplane's altitude and position relative to the ground. If you have seen the popular arcade game ZAXON, then you know about this effect already. Now you can create it with your 99/4A.

```

100 REM *****
110 REM * ON YOUR MARK-GET SET *
120 REM *****
130 REM BY W. K. BALTHROP
140 REM 99'ER VERSION 2.6.1XB
150 REM
160 REM
170 CALL CLEAR :: CALL SCREEN(2)
180 CALL CHAR(96,"FFFFFFFFFFFFFFFF
FFFFFFFFFFFFFFFFFFFFFFFFFFFF
FFFFFFFFFFFFFFFFFFFFFFFFFFFF")
190 CALL CHAR(100,"8060307F7F3060B
00000000000000000000000000000000
000000000000000000000000")
200 SP=2 :: CALL MAGNIFY(4)
210 FOR X=150 TO 21 STEP -16
220 CALL SPRITE(#SP,96,SP/2+2,X,20
0-X)
230 SP=SP+2
240 NEXT X
250 SP=1
260 FOR X=150 TO 21 STEP -16
270 CALL SPRITE(#SP,100,16-SP/2,X+
8,200-X)
280 SP=SP+2 :: NEXT X
290 FOR X=1 TO 27 STEP 2
300 CALL MOTION(#X,0,5):: NEXT X
310 CALL KEY(0,K,S):: IF S=0 THEN
320 END

```

```

100 REM *****
110 REM * SHADY SPRITES *
120 REM *****
130 REM BY W. K. BALTHROP
140 REM 99'ER VERSION 2.6.1XB
150 REM
160 REM
170 CALL CLEAR
180 CALL MAGNIFY(3)
190 CALL CHAR(33,"0103070F1F3F7FFF
"):: CALL CHAR(35,"FFFFFFFFFFFF
FFFFFF"):: CALL CHAR(36,"FFFEFC
F8F0E0C0B0")
200 CALL COLOR(1,12,2)
210 READ L$ :: FOR X=1 TO 24 :: DI
SPLAY AT(X,1)SIZE(28):SEG$(L$,
X,28):: NEXT X
220 CALL SCREEN(2)
230 CALL HCHAR(14,2,33):: CALL VCH
AR(15,2,35,10):: CALL HCHAR(15
,1,33):: CALL VCHAR(16,1,35,9)
240 CALL VCHAR(1,31,35,7):: CALL H
CHAR(8,31,36):: CALL VCHAR(1,3
2,35,6):: CALL HCHAR(7,32,36)
250 CALL CHAR(60,"000000000000B0C0
A091BA4424150E0400000000000020
60A0202040B0")
260 CALL CHAR(64,"00040A112040B0C0
A091BA4424150E0400000000000020
60A0202040B0")
270 CALL SPRITE(#3,60,7,8,186,4,-4
, #5,60,7,4,186,4,-4, #6,64,7,1,
186,4,-4)

```


Computer-Ed.

Of
Carmel, NY & Los Angeles, CA

99/4(A) Programs

- K-6 Reading
- K-6 Language Arts
- K-6 Math

• Follow-up Games
and Worksheets

• Classroom Tested

• Also Available for
TRS-80 Level II

For
FREE Catalogue

Write To:

Computer-Ed.

1 Everett Rd.
Carmel, NY 10512

Want to Get Published?

99'er Home Computer Magazine is looking for articles in all areas of interest that concern Texas Instruments personal computers. Here are the kinds of articles that we want you to write for us:

- Are you a businessman, professional, hobbyist, scientist, or engineer with an interesting microcomputer application? Tell us how it works, what problems you've had to overcome, and what recommendations you have for others. We're especially interested in sharing user-written software with our readers.
- Have you recently purchased a piece of hardware or software that hasn't quite come up to your expectations, or has, on the other hand, impressed you with its performance? We're looking for comprehensive product and book reviews from different perspectives.
- Are you an educator or parent with something to contribute to computer-assisted instruction (CAI)? We're always looking for new ideas and fresh approaches to educational problems.
- Have you created any unusual computer games or simulations? Let our readers experience your excitement and pleasure.
- Perhaps you've modified your microcomputer or have interfaced it with some unique or useful hardware. Send us your how-to-do-it story.

These are just some ideas. Perhaps you have others. Don't worry if you're not a professional writer. Our editorial staff stands ready to help polish up your manuscripts. And we'll be more than happy to send you a copy of our author's guidelines.

Please send your double-spaced typed manuscripts, plus disks or cassettes (recorded on both sides) if the article includes program material, to:

99'er Home Computer Magazine
Editorial Dept
1500 Valley River Drive, Suite 250
Eugene, OR 97401

Sprites In Depth

```
280 CALL CHAR(68,"0000010204091326
4C523F1C63B2020100008040C040A0
5C52A244BB102040B0")
290 CALL SPRITE(#4,68,7,1,210,5,-5)
300 CALL CHAR(96,"000000007F3F1F0F
07070FFEFC7C4C0001061E7CF8FBF0
F0F0F0F070301000")
310 CALL SPRITE(#1,96,6,130,90)::
CALL SPRITE(#2,96,2,160,90)
320 GOSUB 400 :: CALL JOYST(1,JX,JY)::
JZ=((JX+3*JY)/4)+5
330 IF CR=-1 AND JZ<>2 THEN 320
340 ON JZ GOTO 350,360,350,370,350,
380,350,390,350
350 CALL MOTION(#1,0,0,#2,0,0):: G
OTO 320
360 CALL MOTION(#1,-4,0,#2,0,0)::
GOTO 320
370 CALL MOTION(#1,-4,-4,#2,-4,-4)
:: GOTO 320
380 CALL MOTION(#1,4,4,#2,4,4):: G
OTO 320
390 CALL MOTION(#1,4,0,#2,0,0):: G
OTO 320
400 CALL POSITION(#3,XP1,YP1,#4,XP
2,YP2)
410 IF XP1>190 OR YP1<20 THEN CALL
LOCATE(#3,8,186,#5,4,186,#6,1
,186)
420 IF XP2>190 OR YP2<20 THEN CALL
LOCATE(#4,1,210)
430 CALL COINC(#1,#2,2,CR):: IF CR
>-1 THEN RETURN
440 CALL MOTION(#1,0,0,#2,0,0):: C
ALL SOUND(-1000,-6,0)
450 CALL COLOR(#1,7):: FOR TD=1 TO
30 :: NEXT TD :: CALL COLOR(#
1,6):: CALL COLOR(#1,7):: CALL
COLOR(#1,6)
460 RETURN
470 DATA " *****
*****"
```

Line numbers 170 and 180 clear the screen, and the sprite magnification factor is set to 3. A magnification of three sets the sprite characters to normal size. It takes four characters to make up one sprite, so that each sprite is 16 pixels wide. Line numbers 190 and 200 set the patterns for the ground, and make color light yellow. Line 210 reads the DATA statement at 470 and uses that to display the entire screen. Line 220 sets the background at black, and Lines 230 and 240 finish filling in the screen where the display statement could not reach. Lines 250 through 290 create the shapes for the sprites which move along the ground, and 300 sets the pattern for the airplane. Line 310 creates two sprites. The first is the blue airplane; the second is the airplane's black shadow. Both sprites use the same character for their patterns. Line 320 reads the joystick

and converts its reading to a number from 1 to 9. Line 330 makes a check so that a plane on the ground can only go up. In Line 340, the value returned from the joystick is used to branch to the appropriate subroutine. Numbers 360 through 390 set the plane in motion if the joystick input is one of the four legal directions; otherwise line 350 will stop the plane.

Two considerations: The sprites I used as objects on the ground would not wrap to the same position after going off the bottom of the screen. To fix this problem, it was necessary to check their position in Line 400, and relocate them when they reached the bottom of the screen in Lines 410 and 420.

The second problem was the plane's tendency to pass right through its shadow, completely destroying the three-dimensional effect. To alleviate this problem, I put in a coincidence check in Line 430 against the shadow and plane, with a tolerance of two. This means that if the two sprites get within two pixels of each other, the motion stops, you hear a crash and the plane flashes colors. All of this takes place in Lines 440 to 460. The only way to recover from a crash is to pull the plane back up to a safe altitude. Line 470 is the DATA for displaying the screen.

This last program could be modified and built into a full game with a little more effort. For you aspiring programmers, here are a few ideas you might like to try:

1. Increase the number of enemy craft on the ground. Be careful of multiple sprites on one line, and make the plane obstacles clear.
2. Read the fire button on the joystick and give the plane a way to defend itself. Check for any hits against the enemy.
3. Place another plane at the top right corner of the screen, controlled by a second player and joystick number two. Have the two players fight each other in a three-dimensional battle in the air.
4. Design messages to be displayed, and put them on the screen.
5. Modify Lines 340 to 390 in order to use all eight directions of the joystick.
6. Find other uses for shadows and three-dimensional effects.

99'er

DEBUGS ON DISPLAY



99'er Program Bug

A DEBUG occurred in the **Electrical Engineering Resistance Combination** program in the January, 1983 issue beginning on page 19. All occurrences of RAND should be RND instead. The

Quintus article (March, 1983, page 42) mis-stated the game rules. Rule one only prohibits the *Human* from taking the middle square on the first move. The program will not stop you if you try—only your sense of fair play. Apologies to those who looked for, but couldn't find, the rest of line 480 in the **Saving** program on page 13 of the April, 1983 issue. It was accidentally amputated, so here it is in its entirety:

```
480 I=RK :: TY=Y+M/12 :: TP=
INT(NP*TY):: IF TP=0 THEN TP=1
```


Index to Advertisers

AJ International	28
Alpha Software	40
Anchor Automation	26
B & B Graphics	53
Bach Company, The	59
BeeJay Funware	36
Best Software	17
Cintronics	38
CompuTech Distributing, Inc.	41
CompServ	58
Computer Connection I.	47
Computer-Ed	66
Computer Peripheral Resources	40
Computer Peripherals Unlimited	63
Cumberland Technology	63
DEJ Software	61
Data Soft, Inc.	56
Decision-Making Systems Ltd.	53
Denali Data Design	59
Divergent Marketing	61
Dollard, Walter J.	47
Doryt Systems, Inc.	17
Dow, John T.	43
Dynamic Data & Devices	56
Eastbench Software Products	17
Eckhaus, M.K.	62
Extended Software Co.	15
FFF Software	40
Fantasia '99 Software	23
Foundation	14
Futura Software	10
Good News Services	13
Harvey, James	58
Intellitec Computer Systems	33
Intelpro	32
Intersoft	46
JCL Software	53
J & K H Software	13
JKS Software	43
Jerseyware Microcomputer Software	46
Kalglo Electronics Co., Inc.	60
Leading Edge Products, Inc.	2
Magic Software	43
Micro-Concepts	47
Micro-80 Inc.	63
Micro-Ed, Inc.	51
Micronova 99	62
Millers Graphics	40
Model Masters	20
Moonbeam Software	3

Music Workshop	13
MYARC, Inc.	56
Northern Light Software	60
Norton Software	47
Not Polyoptics	11
Novadata Systems Incorporated	11
Pablo Diablo	53
Parallel Systems, Inc.	53
Pewterware	36
Prometheus Software	12
Republic Software	23
Root Assoc., C.A.	62
Ruth, Co., M.W.	23
SA2 Software	58
SAVE, Inc.	35, 61
Scotch Marketing Inc.	29
Soft-Tex	43
Software For The Home	46
Software Specialties, Inc.	62
Software Support	44
Space Age Technology, Inc.	32
Sunrise Software	32
Texas Instruments, Inc.	18, 19, 72
Tex-Comp Users Supply Division	48
Textiger	62
TImagination	61
Titan Software	17
Tyte Software	33
Unisource Electronics, Inc.	27
VID-COM	59
Western Micro Systems	10
York 10 Computerware	36
99/4(A) Program Exchange	33
99'er Bookstore	37
99'er Home Computer Magazine	54, 70
99'er-ware	71

99'er Buyers Guide*

Bach Company, The	36-A, 36-G
Canadian Micro Works	36-H
Dhein's True Value	36-B
Elek-Tek, Inc.	36-C
Keystone Distributing Co.	36-A
LOGIX	36-D
North Hills Computer	36-H
SAVE	36-G
TENEX	36-E
Tex-Comp Users Supply Division	36-F
Unisource Electronics, Inc.	36-G
99'er-ware	36-H

*'99'er Buyers Guide found only in subscription copies.

Game Show Time . . . from p. 22

player has a chance to guess a consonant contained in the word puzzle. For each occurrence of that consonant in the puzzle, the player is awarded that number of "hundred dollar bills."

The Choice is Yours

Each time it is your turn, you may choose to 1) spin, 2) buy a vowel, or 3) solve. If you select 1, the wheel-of-fortune spins as described above. If 2 is your choice, you may buy a chance to guess a vowel that is part of the word puzzle. The purchase price for this opportunity is \$250. If you select 3 and fail to guess the total word puzzle correctly, you lose your turn—but, if you are right you win the current round and get to keep the money that you have built up during the round. Your opponent(s) get a big fat zero.

The instruction booklet is brief, but it describes the game play well. It is a bit sketchy when it comes to describing how to make your own files with version B. For instance, I had to discover for myself that only disk drive number one will work for saving and recalling a puzzle file (naturally I had tried to use drive number two).

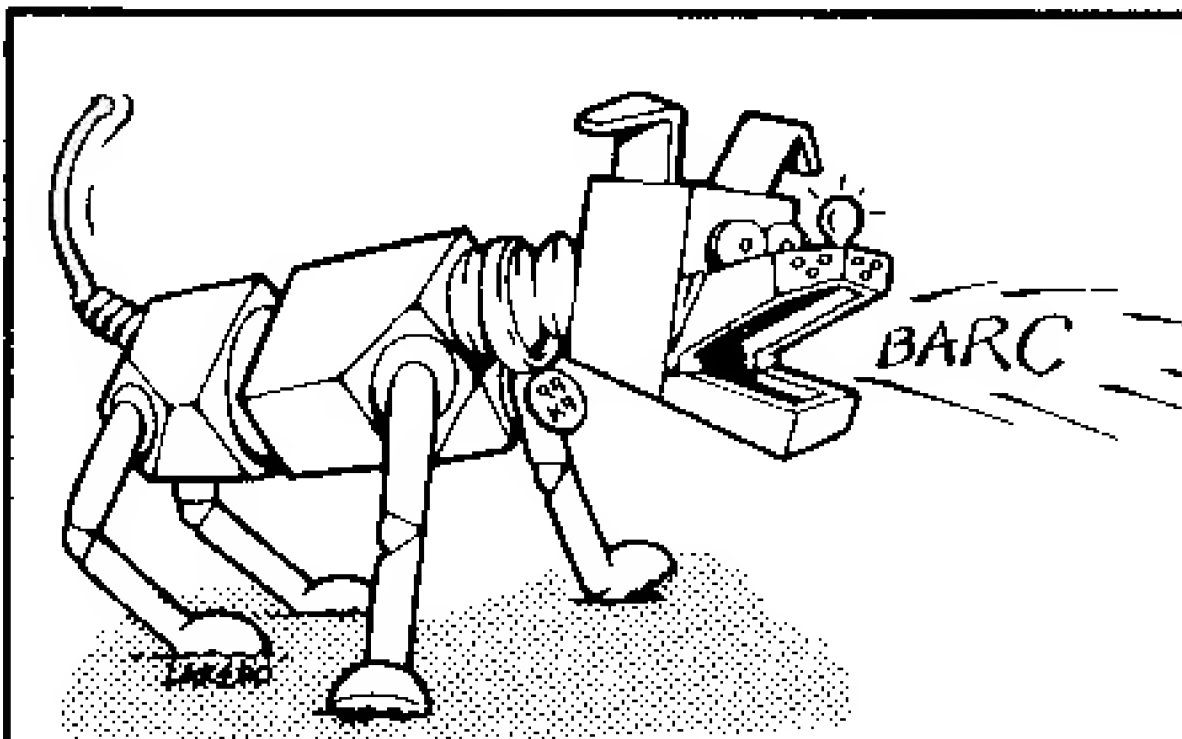
From two to four people may play Spin•A•Fortune, although, I enjoyed playing it all by myself, taking on the roles of two players. It is definitely worth the money for those of you who are looking for a computerized party game. In fact, I think I will plan a party right now just so I can play it . . .

Well, go get a snack and settle back for Spin•A•Fortune! Your host tonight is TI-99/4A—brought to you by Sunrise Software, and now . . . heeeere's TI!



Answers to April's Crossbytes™

P	R	O	G	R	A	M	M	I	N	G
T				B	I	I	L	S		A
R	L	B			P	L	A		N	A
I	N	A	N	E	X	I	R	E	M	E
P	I	U	R						W	E
H	E	X	A	D	E	C	I	M	A	I
E	R	I			D			T	O	G
R	E	I	A	L	I	A	T	O	R	Y
A	D	E			A	I	E		G	E
L				S	I	O	R	E		R
S	Y	N	C	H	R	O	N	O	U	S



B.A.R.C.* BACK

*** (Best Article—Reader's Choice)**

March's Choice

By popular demand, the winner of the March B.A.R.C. Back competition was Jerry Spacek for his article, *Converting Extended BASIC to Assembly Language*. Our hearty congratulations and a \$100 prize go to Mr. Spacek.


```

820 RDT=NX256+0
830 IF RDT>32760 THEN 890
840 CALL PEEK(RDT,C1,C2,C3,C4,C5,C
6)
850 RDT$=CHR$(C1)&CHR$(C2)&CHR$(C3
)&CHR$(C4)&CHR$(C5)&CHR$(C6)
860 IF RDT$=NM$ THEN 910
870 RDT=RDT+8
880 GOTO 830
890 PRINT ":::NOT IN THE TABLE:::"
900 GOTO 750
910 INPUT "NAME OF NEW REF/DEF TAB
LE ENTRY:":TITLE$
920 TITLE$=SEG$(TITLE$&"",1,
6)
930 PN=1
940 PNAME$(PN)=TITLE$
950 DIF=A-D
960 C2=C-DIF
970 VA=C2
980 GOSUB 1810
990 PLOC$(1,2)=VAL$
1000 IF K=0 THEN 1050
1010 A1=B
1020 B1=A
1030 STP=2
1040 GOTO 1080
1050 A1=A
1060 B1=B
1070 STP=2
1080 FOR LOC=A1 TO B1 STEP STP
1090 IF LOC<32768 THEN 1120
1100 LOC1=LOC-65536
1110 GOTO 1130
1120 LOC1=LOC
1130 CALL PEEK(LOC1,X,Y)
1140 IF (X<113)+(X>127) THEN 1220
1150 Z=X*256+Y
1160 V=Z-DIF
1170 IF CT$="N" THEN 1200
1180 IF (V>LM-1)*(V<HM+1) THEN 1200
1190 GOSUB 2660
1200 X=INT(V/256)
1210 Y=V-X*256
1220 CALL LOAD(LOC-DIF,X,Y)
1230 NEXT LOC
1240 IF RD$="N" THEN 1670
1250 REM UPDATE REF/DEF TABLE
1260 CALL PEEK(28700,L,M,N,D)
1270 FFAM=L*256+M
1280 LFAM=NX256+0
1290 IF RP$="Y" THEN 1310
1300 LFAM=LFAM-B
1310 VA=LFAM
1320 GOSUB 1810
1330 LAVAIL$=VAL$
1340 PLOC$(1,1)=VAL$
1350 FFAM=B-DIF+2
1360 VA=FFAM-2
1370 GOSUB 1810
1380 FAVAIL$=VAL$
1390 L=INT(FFAM/256)
1400 M=FFAM-L*256
1410 N=INT(LFAM/256)
1420 O=LFAM-N*256
1430 CALL LOAD(28700,L,M,N,D)
1440 IF RP$="N" THEN 1470
1450 LOC=RDT
1460 GOTO 1480
1470 LOC=LFAM
1480 FOR SS=1 TO 6
1490 CALL LOAD(LOC,ASC(SEG$(TITLE$,
SS,1)))
1500 LOC=LOC+1
1510 NEXT SS
1520 J=INT(C2/256)
1530 K=C2-J*256
1540 IF RP$="N" THEN 1570
1550 CALL LOAD(RDT+6,J,K)
1560 GOTO 1580
1570 CALL LOAD(LFAM+6,J,K)
1580 PN=PN+1
1590 IF LFAM+((PN-1)*8)>32760 THEN
2040
1600 CALL PEEK(LFAM+((PN-1)*8),C1,C
2,C3,C4,C5,C6,A1,A2)
1610 PNAME$(PN)=CHR$(C1)&CHR$(C2)&C
HR$(C3)&CHR$(C4)&CHR$(C5)&CHR$
(C6)
1620 VA=A1*256+A2
1630 GOSUB 1810
1640 PLOC$(PN,2)=VAL$
1650 VA=LFAM+((PN-1)*8)
1660 GOSUB 1810
1670 FLOC$(PN,1)=VAL$
1680 GOTO 1580
1690 REM CONVERT TO DECIMAL
1700 TN2=0
1710 FOR P=1 TO 4
1720 TEMP2$=SEG$(TEMP$,P,1)
1730 IF ASC(TEMP2$)>57 THEN 1780
1740 TN=ASC(TEMP2$)-48
1750 TN2=TN2+TN*(P)
1760 NEXT P
1770 RETURN
1780 TN=ASC(TEMP2$)-55
1790 GOTO 1750
1800 REM CONVERT TO HEX
1810 VAL$=""
1820 FOR P=1 TO 4
1830 V=INT(VA/S(P))
1840 VA=VA-(V*(S(P)))
1850 IF V>9 THEN 1880
1860 VAL$=VAL$&STR$(V)
1870 GOTO 1890
1880 VAL$=VAL$&CHR$(V+55)
1890 NEXT P
1900 RETURN
1910 INPUT "(4 DIGIT HEX ADDRESS):"
:TEMP$
1920 IF LEN(TEMP$)>4 THEN 1910
1930 IF LEN(TEMP$)=4 THEN 1950
1940 TEMP$=SEG$("0000"&TEMP$,LEN(T
EMP$)+1,4)
1950 FOR TT=1 TO 4
1960 TT1=ASC(SEG$(TEMP$,TT,1))
1970 IF (TT1<48)+(TT1>70)+((TT1>57)
*(TT1<65)) THEN 1910
1980 NEXT TT
1990 GOSUB 1700
2000 IF CT$="N" THEN 2020
2010 IF (TN2<LM)+(TN2>HM) THEN 2850
2020 PRINT ::
2030 RETURN
2040 CALL CLEAR
2050 PRINT TAB(19);"OLD NEW"
2060 PRINT "FIRST ADD.":TAB(19);FAP
$:TAB(25);NPA$
2070 PRINT "LAST ADD.":TAB(19);LAP$
:TAB(25);FAVAIL$
2080 PRINT "ENTRY POINT":TAB(19);EAP
$:TAB(25);PLOC$(1,2)
2090 PRINT "REF/DEF STARTS AT":TAB(
25);LAVAIL$
2100 PRINT ::"MEMORY RELOCATED ";(-
1)*DIF;"BYTES"
2110 PRINT ::
2120 PRINT "REF/DEF TABLE ENTRIES"
2130 SS1=1
2140 PRINT ::"LOCATION NAME E
NTRY"
2150 FOR SS=SS1 TO SS1+6
2160 IF SS=21 THEN 2250
2170 IF PNAME$(SS)="" THEN 2250
2180 PRINT PLOC$(SS,1);TAB(12);PNA
M$(SS);TAB(22);PLOC$(SS,2)
2190 NEXT SS
2200 PRINT ::"PRESS ENTER TO CONTIN
UE"
2210 CALL KEY(0,K,S1)
2220 IF S1=0 THEN 2210
2230 SS1=SS
2240 GOTO 2150
2250 IF PR$="Y" THEN 2270
2260 PRINT ::"RECORD ALL DATA, AND"
2270 PRINT "PRESS ENTER TO CONTINUE
"
2280 CALL KEY(0,K,S1)
2290 IF S1=0 THEN 2280
2300 IF PR$="N" THEN 2490
2310 OPEN #1:DEV$
2320 PRINT #1:"MEMORY RELOCATION RE
PORT":
2330 PRINT #1:TAB(25);"OLD";TAB(35)
;"NEW"
2340 PRINT #1:"FIRST ADDRESS":TAB(2
5);FAP$:TAB(35);NPA$
2350 PRINT #1:"LAST ADDRESS":TAB(25
);LAP$:TAB(35);FAVAIL$
2360 PRINT #1:"ENTRY POINT":TAB(25)
;EAP$:TAB(35);PLOC$(1,2)
2370 PRINT #1:"REF/DEF STARTS AT":T
AB(35);LAVAIL$
2380 PRINT #1::"MEMORY RELOCATED";
(-1)*DIF;"BYTES"
2390 PRINT #1::
2400 PRINT #1:"REF/DEF TABLE ENTRIE
S"
2410 PRINT #1:
2420 PRINT #1:"LOCATION":TAB(12);"N
AME":TAB(25);"REF/DEF ENTRY PO
INT"
2430 FOR SS=1 TO 20
2440 IF PNAME$(SS)="" THEN 2470
2450 PRINT #1:PLOC$(SS,1);TAB(12);P
NAME$(SS);TAB(25);PLOC$(SS,2)
2460 NEXT SS
2470 PRINT #1:::"END OF REPORT"
2480 CLOSE #1
2490 STOP
2500 PRINT :::"YOU ARE TRYING TO M
OVE ABOVE YOUR LIMIT"
2510 VA=D+(B-A)
2520 GOSUB 1810
2530 PRINT "HIGH LIMIT NEEDS TO BE
":VAL$
2540 PRINT :::"DO YOU WISH TO CHANG
E THE PARAMETERS?"
2550 INPUT "(Y/N)":CHP$
2560 PRINT ::
2570 IF (CHP$<>"N")*(CHP$<>"Y") THEN
2540
2580 IF CHP$="Y" THEN 250 ELSE 620
2590 PRINT :::"YOU ARE TRYING TO M
OVE BELOW YOUR LIMIT":
2600 PRINT "YOUR LOW LIMIT NEEDS TO
BE":TEMP$:
2610 PRINT "DO YOU WISH TO CHANGE T
HE PARAMETERS?"
2620 INPUT "(Y/N)":CHP$
2630 PRINT ::
2640 IF (CHP$<>"N")*(CHP$<>"Y") THEN
2610
2650 IF CHP$="Y" THEN 250 ELSE 610
2660 VA=V
2670 GOSUB 1810
2680 TO$=VAL$
2690 VA=Z
2700 GOSUB 1810
2710 FROM$=VAL$
2720 VA=LOC1
2730 GOSUB 1810
2740 PRINT :::"YOUR PROGRAM WILL N
EED TO WORK OUTSIDE OF YOUR
LIMITS"
2750 PRINT ::"THE INSTRUCTION AT LO
CATION":VAL$;" ORIGINALLY USED
THE":"ADDRESS REFERENCE ";FRO
M$;". "
2760 PRINT ::"IT NOW NEEDS TO CHANG
E THAT ADDRESS REFERENCE TO ";
TO$;". "
2770 PRINT "DO YOU WISH TO HALT THI
S":"PROGRAM AND START OVER?"
2780 INPUT "(Y/N)":CHP$
2790 PRINT ::
2800 IF (CHP$<>"N")*(CHP$<>"Y") THEN
2770
2810 IF CHP$="Y" THEN 2830
2820 RETURN
2830 PRINT :::"YOU MUST RELOAD MEM
ORY WITH YOUR ASSEMBLY PROGRAM
BEFORE USING THIS PROGRAM AGAI
N":
2840 STOP
2850 PRINT :::"THAT ADDRESS IS OUT
SIDE OF YOUR LIMITS":
2860 VA=HM
2870 GOSUB 1810
2880 PRINT "HIGH MEMORY LIMIT=":VAL
$
2890 VA=LM
2900 GOSUB 1810
2910 PRINT "LOW MEMORY LIMIT=":VAL$
2920 PRINT :::"YOUR INPUT WAS FOR AD
DRESS":TEMP$:
2930 PRINT "IS THIS A VALID ADDRESS
?"
2940 INPUT "(Y/N)":CHP$
2950 IF (CHP$<>"Y")*(CHP$<>"N") THEN
2920
2960 IF CHP$="Y" THEN 2030 ELSE 260
2970 PRINT :::"YOU HAVE ENTERED A L
AST":"ADDRESS LOWER THAN OR EQ
UAL TO THE FIRST ADDRESS":
2980 GOTO 260
2990 PRINT "THE ENTRY ADDRESS MUST
BE":"BETWEEN THE FIRST, AND LA
ST ADDRESSES. TRY AGAIN"
3000 GOTO 260
3010 END

```


FULFILLING . . . from p. 55

and word recognition. Feedback from users indicates that the students have responded positively.

Encouraging Development

From our own observations and from those of parents using the system, we are encouraged about the future of computer assisted instruction for the mentally handicapped. Parents comment that their children show uncharacteristic enthusiasm and persistence when doing the lessons. These parents are realistic in their appraisal of the lessons and do not expect dramatic or revolutionary improvement. They are, however, optimistic about the potential for developing their child's ability. They know that their children are not going to be made into average learners any more than the Special Olympics has produced a 4-minute miler. They recognize that the activity is healthy and rewarding and can help improve skills. Our initial hopes for the lessons have been supported, and we have gained insight into other benefits unexpected a year ago.

Serendipity

We have been delighted to observe students working in small groups or in pairs, cooperating with each other. A healthy social interaction comes of students supporting and encouraging each other. This social interaction is a very beneficial experience. The com-

puter exercise can also provide a focal point for family interaction, with parents and siblings working with the learner at home. In the institution, the professional worker can help the student develop social skills as they work on counting and word skills. All in all, this supportive social interaction removes the computer experience from the realm of a cold mechanical process. This was a surprising bonus which we were delighted to observe, because we felt all along that the computer should *never* be used as a substitute for sensitive human interaction. Now we know that it can effectively *stimulate* communication and support among the students.

Software Requirements

There are several factors that determine whether a program will be successful with mentally handicapped learners. We found, for example, that color animated graphics integrated with synthesized speech are absolutely essential if the lessons are to be effective with non-readers. It is amazing that some well-meaning computer programmers design software to develop beginning skills which must be used on an intermediate or advanced level. Some programs designed to teach the alphabet require students to read in order to use the software!

Major publishers have yet to provide software for the mentally retarded. Much of the software for very young

children is, however, easily adapted for the retarded. Indeed, it is not necessary for the software to have been developed specifically for the retarded so long as the content and design of the program are suitable for beginning learners (whether they be 3 or 30 years of age.) Of some concern though, is the type of visual content provided for the student of mature years. The thirty-year-old retarded individual functioning at a mental age of 10 is not the same student as a fifteen-year-old at the same mental age or a normal ten-year-old. A cartoon character which works very well for a 10 year old may be perceived as "childish" by the older learner. This should be kept in mind by those planning to develop software for the retarded.

We have developed eight programs in basic counting, arithmetic, and word recognition that are available for distribution. We also plan to design additional software for handicapped/retarded learners. These will assist in development of concepts preliminary to counting and spelling. We plan to concentrate on such areas as color recognition, shape and size discrimination, measuring, telling time, and directions. If you are aware of special programs which are available through other sources or would like to see us develop them, please contact us. We are certain that the next two years will see the rapid development of software to serve our mentally handicapped children and adults.

99'er

Tortoise's from p. 51

But, for other recursive programs, there are no BASIC equivalents. For example:

```
TO COUNT :LIST
IF :LIST = [ ] OUTPUT 0
OUTPUT 1 + (COUNT BUTFIRST :LIST)
END
```

Sub-Goals

A strategy closely related to recursion is breaking down a problem into sub-goals. The best example of such a solution is the *Tower of Hanoi* problem (as solved in Vol. 1, No. 6 of this magazine by Roger Kirchner). In that particular problem, each sub-goal is solved with a program which can be applied to the next larger goal. The sub-goals strategy is related to simplification—a complex job is thought of as a series of several less complex jobs. Each of the less complex jobs is accomplished by writing simple programs and the complex job is accomplished by putting all these simple programs together. Notice that this also teaches the programmer to consider the problem one step at a time. In memory training, disease fighting, military combat, and computer problem solving, the maxim "Divide and conquer" is more than just an empty saw. LOGO lends itself to such hierarchical programming. BASIC discourages powerful heuristics because such tactics can only be

modestly simulated with a spaghetti bowlful of GOSUBs and EXITS.

Problem Space Definition

LOGO facilitates the resolution of problems by helping you to 1) view from different perspectives, 2) break down the problem space into its independent states, and 3) name those states and procedures which may be solutions. Naming solutions may not seem especially powerful, but it is when you consider what having a name affords. Once a procedure is named, you can talk about it, think about it, and manipulate it symbolically without producing the entirety of it. Without the ability to name procedures, procedural thinking would be difficult and constrained, if not impossible.

Both the philosopher of science Thomas Kuhn and the historian Herbert Butterfield attribute revolutions in science to new perspectives discovered by visionaries. An example that Papert often uses is to compare definitions of circles. Circles can be described with Euclidean geometry, with Cartesian analytic geometry, with integral calculus, or with Turtle Geometry. In LOGO all four definitions can exist simultaneously. In particular, LOGO makes transitions between Cartesian and Turtle views of problems easy. The Turtle geometry commands of Right or Left can coexist happily in a program which also contains the more Cartesian SETHEADING.

Psychologists and mathematicians who study problem solving attribute successful solutions to defining a problem in a view concordant with the ultimate solution. The more different ways that a problem can be seen, the more likely it is that a view concordant with the solution will be used. Similarly, the better you can see the problem space's states, the more likely you are to isolate the relevant parts of the problem space.

LOGO facilitates state descriptions by forcing the programmer to see that a sprite's xcor, number, ycor, heading, color, shape, and speed are each independent of all other sprite states as are the states of the turtle (xcor, ycor, heading) and the turtle's pen (up, down, erase, reverse).

A Real Winner

Which is the winning computer language? Certainly BASIC has its uses, but LOGO gives you the power to solve programming problems quickly, easily, and elegantly. And you are the real winner if you realize that LOGO problems are not limited to just graphics and games, and use LOGO to its full list processing power.

Papert S. *Mindstorms: Children, Computers, and Powerful Ideas*. New York, Basic Books, Inc., 1982.

99'er



Selected Programs From This Publication Are Now Available on Cassette Tape

- All purchasers of these packages are responsible for obtaining the individual documentation and program instructions in the indicated back issues of the magazine. When an issue goes out of print, copies of the program articles will be made available for purchase.
- If programs have been updated/enhanced since original publication, a printed copy of documentation changes will be provided with the tapes.
- Both subscriber & non-subscriber prices are indicated. To be eligible for the lower subscriber prices, you must be a current, paid magazine subscriber. All orders will be verified prior to shipment.
- Authors of these and future programs distributed on tape and disk will receive Bonus Payments based on the number of tapes sold. In fairness to them, please observe the Copyright laws, and report any incidents of "piracy" to our office.
- Recognized TI User Groups should contact us for special bulk terms & rates. — No dealers, please.

Note: Programs in this issue will be available on a future tape release.

Use the bind-in card in the back of the magazine for your convenience in ordering.

Shipping—\$1.00 for 1st tape, 50 cents each additional. Foreign Orders Shipped Airmail—\$3.00 for 1st tape, 75 cents each additional.

PACKAGE #M2/5

From Vol. 2, No. 6
and Vol. 2, No. 7

Giant & Dwarfs (Extended BASIC)
Boa Alley (TI BASIC)
Word World (Extended BASIC)
Last Ruins (TI BASIC)
Beeline (Extended BASIC)
M/M Relocator (TI BASIC w/Mini Memory)

\$12/sub; \$20/non-sub

PACKAGE #M2/2

From Vol. 2, No. 1

Termite (TI BASIC)
Tex-Scribe (Extended BASIC)
Gold Rush (Extended BASIC)
Plotting Routines (Assembly Object Code for Mini Memory Loader)

\$12/sub; \$20/non-sub

PACKAGE #M2/4

From Vol. 2, No. 4
and Vol. 2, No. 5

Lifeline to Titan (Extended BASIC)
Night Blockade (TI BASIC)
Quintus (TI BASIC)
Space Junket (Extended BASIC)
M/M Disassembler (TI BASIC w/Mini Memory)
Say & Spell (Extended BASIC)

\$12/sub; \$20/non-sub

PACKAGE #M2/1

From Vol. 2, No. 1

Up Scope (Extended BASIC)
Micro Jaws (Extended BASIC)
Knight's Tour (TI BASIC)
Screen Dump (Assembly Object Code for Mini Memory Loader)
ASPIC (TI BASIC)

\$12/sub; \$20/non-sub

PACKAGE #M2/3

From Vol. 2, No. 3

Close Encounters of the Simon Kind (TI BASIC)
Learning the Alphabet (TI BASIC)
Cyber-Dice (Extended BASIC)
Electrical Engineering Resistance (TI BASIC)

\$12/sub; \$20/non-sub

PACKAGE #M1/6

From Vol. 1, No. 6

Verbose (TI BASIC with Speech)
Color Mapping (TI BASIC)
County Fair Derby (TI BASIC)
Battle Star (Extended BASIC)
N-VADER (Extended BASIC)
Pre-School Block Letters (TI BASIC)

\$12/sub; \$20/non-sub

Back Issues of are Still Available . . . but quantities are limited so ORDER TODAY!



Each Only
\$3.95 postpaid

ISSUE #1
ISSUE #2
ISSUE #3
ISSUE #4
OUT OF PRINT

EUREKA!
2 CARTONS OF ISSUE #5
DISCOVERED INCORRECTLY LABELED
FIRST COME—FIRST SERVE!

ISSUE #6 (Partial Contents)

• How to Produce Sound Effects • Debugging a Game Program • How to Start a Users' Group • Verbose: A Speech Vocabulary Expansion Aid • Color Mapping • Dynamic Manipulation of Screen Character Graphics • The Beginner's Guide to Cassette Operation With the Home Computer • Pre-School Block Letters and Data Compilation • Picking the Ponies in TI BASIC • Battle Star Space Game • 3-D Animation on the Home Computer • Programming Tips • Who's LOGO For? • Tower of Hanoi in TI LOGO • A Review of the TI Lesson Development Software • An Interview with a Game Designer • Learning Assembly Language with a Magic Dragon • and much, much more.

NOVEMBER 1982 (Partial Contents)

• Chatting with Your Micro: Languages for the Home Computer • A Review of the Smith Corona TP-1 Daisy Wheel Printer • The Micro Jaws Arcade Game • A Knight's Tour in TI BASIC • LOGO Has Style • ASPIC: A Language for Children • A p-System Beginner's Tutorial • An Interview with a p-System Pioneer • A Mini-Memory Screen Dump to the Home Computer Printer • Up Scope!—An exciting Undersea Combat Game • Strategy for Munch Man • A Brief Encounter with a TI Hand-Held Computer • 99'er Shopping Bus • A Pocket Battleship • Sub-Programs in Extended BASIC • Arcade & Adventure Game Reviews • and much, much more.

DECEMBER 1982 (Partial Contents)

• Tex-Scribe: A Text Editor for the Home Computer • A Christmas Computer Carol • Managing a Mailing List the Futura Way • Parsec: The Arcade Game • Plotting With the Home Computer—Pixel by Pixel • Preventing the Situation—On Not Memory Full • A Colorful Tour of Ti-Fest: The Home Computer Show • Santa's Workshop: The Making of a Home Computer • The Turtle Arcade: Movies & Video Games in LOGO • Controlling a BASIC Termite • The 99'er Gold Rush—An Adventure in the TI World • Plus Games, Reviews, and much, much more.

JANUARY 1983 (Partial Contents)

• Computer Assisted Instruction for the Handicapped • p-System Basics • Debugging in LOGO • The Dew-A Gazelle Flight Simulator • Note Whiz and Pitch Master Musical Game Reviews • Learning With the PLATO Computer Library • Strategies for Adventure Gaming • Death Drones • Using the Line-By-Line Assembler • Close Encounters of the Simon Kind • Electrical

Engineering Education Program • Interview With an Arcade Game Designer • TI Invaders • Programming With Pascal • Cyber-Dice • News and Happenings in the Home Computer World • Arcade Game Reviews • The Trifid Adventure Game • Programming Tips • and much, much more.

FEBRUARY 1983 (Partial Contents)

• Texas Instruments at the Winter Consumer Electronics Show • Home Computer Printers on Review • How to Create Math Games in LOGO • Vectors in LOGO • ASPIC: A Language for Teachers • The Joys of Adventuring—Part 2 • Programming Pointers with Chuck-A-Luck—Part 4 • Interview With the Voice of Parsec • Why You Need a Printer for Your Home Computer • Lifeline to Titan Space Game • Night Blockade Battleship Game • Tower of Hanoi Pocket Program • Computer Gaming Software Reviews • News of Late Developments in the World of Home Computers • and much, much, more.

MARCH 1983 (Partial Contents)

• An Introduction to the TI-99/2 Basic Computer • The Hex-bus and the A/A Connection • Making Your Own Say and Spell Game • Disabled Children Learn and Grow • Super Cataloger—A Review of a Disk Library Utility Program • TI's New CC-40 Compact Computer • Robots and Their Social Impact • Twenty Questions With Robot Redford • The Gravity of LOGO • Joystick Jockey—An Overview of Remote Controllers • Parsec Strategy • Converting Extended BASIC to Assembly Language • Matrix Muncher • Mini Memory Disassembler Utility • Pulling the Shade on Sprites • Letters on LOGO • Tiny Tutorials • Games programs, reviews, and much, much more.

APRIL 1983 (Partial Contents)

• Computer Assisted Savings Planning to Build Your Nest Egg • Tex-Cipher Writes and Decodes Secret Messages • Crossbytes—Computer Vocabulary Crossword Puzzle • Cutting Corners On Your Food Budget Using Coupons • Introducing Financial Planning with Multiplan • The Design Philosophy of the Compact Computer • LOGO Takes On the Popular Fifteen Puzzle • Super Language—Programming Sprites in Mini Memory • Colorful Word World—Reading Readiness for Pre-schoolers • Gameware Buffet's A-Mazing Boa Alley Game • Giant and Dwarfs Entrapment Game • Game Reviews • Programming Tips • Money Saving Hints • and much, much more.



Keep Your Magazines & Tapes Together With a

99'er FINDER-BINDER™



- Big enough to hold 6 magazines and 12 tapes
- Uses wire straps to hold magazines so that no hole punching is necessary
- Attractive and Durable

—Only \$10.95*

(magazines and tapes not included)

FREE 99'er Master Index with each 99'er Finder-Binder order

(will be mailed when available in 2nd Quarter, 1983)



*Only \$10.95 without cassettes, plus \$4.00 shipping & handling.
6 High-Quality 99'erware C-10 Digital Computer Cassettes
(with special BASE tape and 5-screw housing for data integrity)
Available separately for \$7.00 plus \$2.00 shipping & handling.

SPECIAL 99'er Finder-Binder that is packed:

- with 6 of the above blank cassettes for only \$16.95.
- with 12 of the above blank cassettes for only \$21.95.

Add \$4.00 shipping & handling to either order.



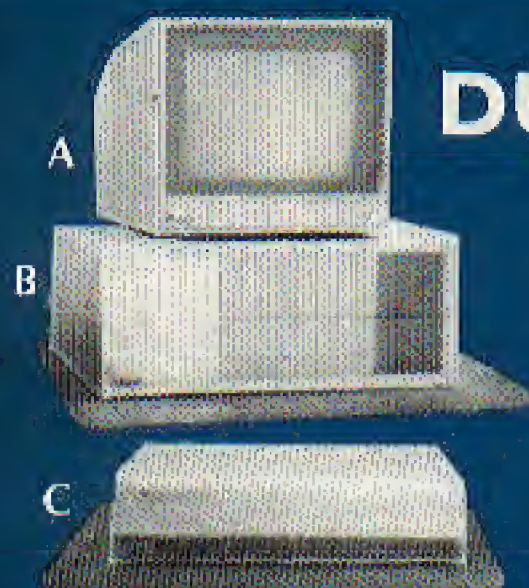
The TEX-SETTE™ Adapter

Cassette Compatibility At Last!

If The TI-99/4A Will Not Control Your Cassette Recorder Through Its Remote Jack, We Have The Solution For You...



- Low cost — Only \$5.95 plus \$1.00 each for postage and handling.



DUST COVERS

Features:

- Equipment Protection
- Handsome Appearance
- Custom-Fit
- Antistatic Treated
- Quality Construction



A	10" Color Monitor Cover	\$10.95
	13" Color Monitor Cover (not shown)	\$12.95
B	Peripheral Expansion Box Cover	\$12.95
C	TI's 99/4 Matrix Printer Cover (same as Epson MX-80 Cover)	\$9.95
D	Cassette Recorder Cover (1 size fits up to 10" x 6")	\$4.95
E	TI-99/4(A) Console Cover	\$8.95
F	Speech Synthesizer Cover	\$3.95
G	Peripheral Box Cover (Specify: 32K Memory Expansion, RS232 Interface, or Disk Controller)	\$5.95
H	Thermal Printer Cover	\$8.95
I	Disk Memory Drive Cover	\$5.95

DEALER INQUIRIES INVITED

Add \$2.00 shipping/handling for the first dustcover; 50 cents for each additional cover.

99'erware



INNOVATIVE PRODUCTS FOR TMS9900-BASED PERSONAL COMPUTING

P.O. Box 5537
Eugene, Oregon 97405
Tel. (503) 485-8796



TI LOGO: It opened a door they thought was locked.

It opened a door to their minds.

The key: a Texas Instruments Learning Computer and TI LOGO, a programming language developed by TI and MIT.

In his inner-city, New York junior high classroom, teacher Steve Siegelbaum explains why it works so well.

"When they use it, they think they're teaching the machine. In reality, it's teaching them how to

learn. It definitely improves their attitude toward their other courses. Written and verbal expression improve—they're eager to show you, to tell you, what they've done."

Another teacher, Pete Rentof, adds, "What it fights is fear of failure—a mistake becomes a starting point. The whole learning process turns into a positive experience. It works."

The TI Learning Computer,

with TI LOGO and many other educational programs, is equipped to help open doors in any classroom. Including yours. For information on this remarkable system, contact: Texas Instruments Customer Relations, P.O. Box 53 Lubbock, Texas 79408.



TEXAS INSTRUMENTS

© 1982 Texas Instruments